

Japanese Woodblock Printing



Rebecca Salter

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*Japanese Woodblock
Printing*



Printer's Song

Ketsu ga ochizuni
Kentō ga aeba
Oyakata zurashite
Tema o toru

Could I print without fouling
Or register without failing
I might have run away
To be a master ere this day

*Japanese
Woodblock
Printing*

REBECCA SALTER



A Latitude 20 Book

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Front cover illustration: detail of centre panel of *A Parody of the Four Social Classes: Artisans, a group of women in a workshop producing woodblock prints*, Utagawa Kunisada (signed Toyokuni), 1857, © The British Museum.

Back cover illustration: *Spring II*, Rebecca Salter, UK. Edition 7, image size 18 x 14.5cm, paper size 45 x 37cm, 2000. Woodblock on *kōzo* paper.

Frontispiece: *A Parody of the Four Social Classes: Artisans, a group of women in a workshop producing woodblock prints*, Utagawa Kunisada (signed Toyokuni), 1857, © The British Museum. Left to right: On the left the printer is taking a break from printing, while in the centre a woman is clearing a block in the background. In the foreground, paper is being sized and hung to dry. On the right, a woman is cutting a block while another is sharpening the tools.

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Note: throughout this book, all Japanese names are given in Japanese style; family name followed by given name.

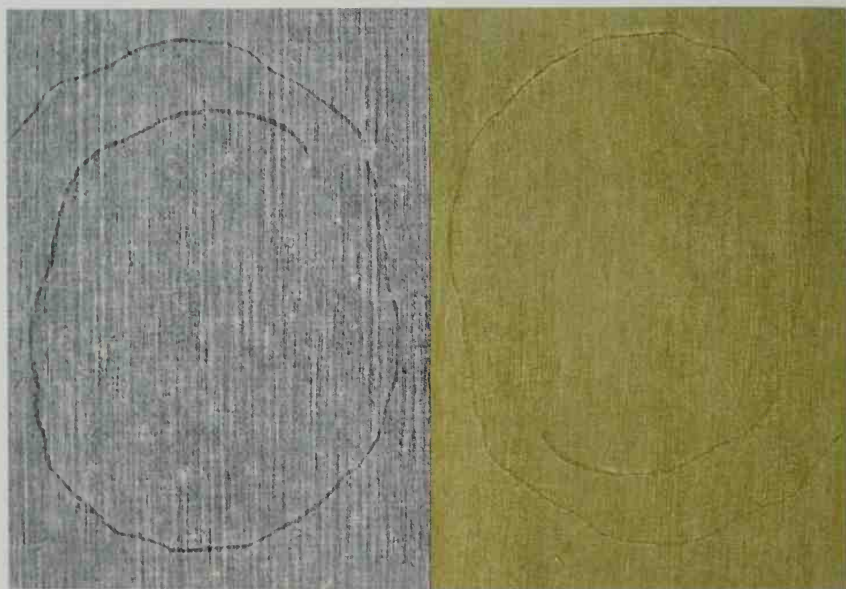
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Transitus IV, Rebecca Salter, UK. 23 x 33cm, 1996.
Woodblock on kōzo paper.

INTRODUCTION

 Japanese woodblock prints really need very little in the way of introduction. Of all the sophisticated traditional arts and crafts of Japan, they are probably the most widely known in the West. The bold yet refined compositions are as fresh to the Western eye now as they were when they first came to the attention of the Impressionists in the 19th century and exercised such a powerful influence over generations of artists. The technique and the art form grew out of a very different cultural environment to our own and it was the genius of a few Japanese artists to realise the potential and exploit it to the full. There was, as so often happens, a time of spectacular creativity, followed by a slow decline faced with competition from new techniques. But the fundamentals of Japanese woodblock are, if anything, more relevant today than they have ever been. In an era of environmental consciousness, a printmaking tradition which eschews chemicals in favour of natural materials has a lot to offer.

The basics of the Japanese technique will be familiar to any practitioner of relief printing. The unfamiliarity lies in the materials used to print and the method of registering and making the impression. Trying to use the technique outside Japan has often been unnecessarily complicated because certain materials are not easily available and no substitutes have been suggested. This leaves many printmakers feeling that it is an exotic technique which is just too difficult to tackle. With a little ingenuity, this is definitely not the case.

The success of Japanese woodblock lies in the total compatibility of the materials chosen for the task. It just happens that they were all materials abundantly available in Japan. There were plentiful supplies of cherry wood for the blocks and Japan also had the shrubs and quantities of clean water necessary for the papermaking industry which had, like woodblock printing, been introduced from China via Korea. *Washi* (Japanese paper) has a long fibrous nature which makes it suitable for brush painting and calligraphy but also for printing.

The Eastern tradition of painting and printing is based on the use of pigments mixed with water rather than oil as in the West. This demands a completely different set of materials and *washi* was, and is, fundamental to the tradition. The main drawback with water-based printing is, of course, registration. The effect of oil-based pigments on Western paper in registration terms is minimal because the ink just sits on the surface. With the

Japanese method, the pigment and paper become one – the colour is forced into the fibres of the paper almost in the way that textiles are dyed. The problem which had to be overcome was how to accommodate the change in the paper (and therefore registration) caused by the absorption of the water with the pigment. The answer lies in the nature of *washi*. The tradition of printing with pre-moistened paper took advantage of the fact that once *washi* has been dampened, subsequent movement is minimal. The solution to the requirement for an accurate registration system was found in the development of the *kentō* (registration marks) cut directly on each block. This very simple innovation proved to be exact enough for the most ambitious multicoloured prints. The final technical contribution to the success of the technique was the Japanese development of the *baren* (printing pad). It appears to be a very modest hand-held press but it is constructed in such a way that pressure from the shoulder is transferred efficiently and the pigment from the block is forced right into the fibres of the paper resulting in perfect, flat colour.

The highly-trained artisans of the woodblock world perfected the technique and through extraordinary skill and ingenuity contributed to the flowering of a remarkable artistic movement. Their role, however, goes almost unrecognised as their names were only occasionally recorded on the prints. The names of the publisher who commissioned the print and the artist who did the original drawing are known, but they relied completely on the quiet skills of the carvers and printers to bring their vision to reality.

I hope this book will not only provide a manual for the interested printmaker but will also reveal the technical skills of these craftsmen which will in turn inform the appreciation of the prints. I have included historical detail of the technique and the traditional method but I think it is more important to keep the method alive by offering substitutes where possible, so that more printmakers around the world are able to explore the potential of this rich tradition.

Chapter 1

JAPANESE WOODBLOCK HISTORY

■ The origins of Japanese woodblock printing lie in China and were introduced to Japan, along with papermaking, in the 8th century by Buddhist missionaries, who brought with them a number of arts and skills associated with Buddhist culture. The techniques were initially used primarily for religious and devotional texts; the move to use the method for secular purposes came later, as did the progression from book form to single printed sheet. Following unrest in China in the second half of the 17th century, many artists and writers fled to Japan, possibly taking the art of colour printing with them.

However, the exact chronology of the early years of colour printing in Japan is unclear. The Japanese would undoubtedly have already seen Chinese prints and would probably have experimented with the technique themselves, or they may have picked it up directly from the refugees. The most interesting aspect of the relationship between Chinese and Japanese woodblock is how differently it developed. In China it was seen primarily as a way of copying paintings and reproducing them for mass production. The aim was to make a print look as much like a painting as possible. There was less scope for the individual expression of the artist or the craftsman – it was more of a technical exercise. In Japan, however, the technique was allowed to flourish in its own right. The artists recognised its potential and worked in such a way that its strengths would be exploited. The Eastern pictorial tradition was completely different to its Western counterpart – artists tended not to work from nature but from a reservoir of images in their mind. Painting, poetry and calligraphy were emotional expressions of the moment rather than faithful depictions of the surroundings. This way of working extended to the printing technique which recorded them and a whole world of respected craftsmanship developed as a result.

The earliest woodblocks were monochrome using *sumi* (Japanese ink) and were primarily produced as book illustrations. Close stylistic links can be shown between these early prints and the indigenous painting school called *yamato-e*. There were strong outlines, abstracted forms, intricate use of pattern and no attempt at representing depth or volume. These books were all produced in the main publishing centres of Ōsaka, Kyōto and Edo (the original name for Tōkyō).

By the early 1700s these publishers (especially in Edo) had started to exploit the burgeoning market for single sheet prints. At first they were produced in black and white but before long the printmakers began to colour them by hand. The first colours used were *tan* (red lead) and *suō* (darker red/yellow from sappanwood). The printmakers also mixed *sumi* with *nikawa* (an animal glue binder) to form a rich lacquer black which was then used to highlight certain areas of the print. This technique was called *urushi-e* (literally lacquer print). A rose colour (*beni*) made from the safflower and a green were added to the colours used. This type of print was called *beni-e*. At this stage the prints were coloured by hand mostly by outworkers. The finished prints were delivered at the rate of around 200 per day and ultimately the hand colourers could no longer keep up with the demand. Hand-colouring also added considerably to the cost of the final print. As demand outstripped supply, the need to speed up the technique became real. To be able to cope with mass production, the most urgent requirement was for a practical method of registration. This came about with the invention of *kentō* (registration marks) which are a huge improvement on the Chinese system of registration for colour prints (see diagram page 77) which was far from accurate. Colour prints had been produced as early as the 1730s but they were made in small quantities as private editions for the leisured classes. The earliest colour prints for general consumption were the *benizuri-e* (which means printed *beni-e*) using the two colours of rose-red (*beni*) and green produced in the 1740s.

The first artist to work in full-colour print is acknowledged to be Suzuki Harunobu (1725-70). In 1765 he produced a privately commissioned calendar in three colours requiring very careful registration, followed in the next few years by designs printed in as many as nine or even more colours. The period between 1765 and 1786 saw the technique become ever more sophisticated in the number of colours used. The resemblance of the designs to a rich brocade led to them being called *nishiki-e* (literally brocade pictures).

The social circumstances in which this art form flourished are important in understanding its attraction to the public. In Japanese the prints are known as *ukiyo-e*, a term which literally means 'pictures of the floating world'. The concept of the 'floating world' refers to a Buddhist reference to the illusory or sensory world and the transitory nature of life. The wealthy class of merchants in the business areas of Japan's big cities reinterpreted this idea of *ukiyo* as the enjoyment of all the pleasures of life. They had money at their disposal but under the strict rules of Japan's stratified society they were denied access to the higher forms of art such as *Noh* theatre or approved schools of painting. Their solution was to create their own alternatives, two of the most vibrant being the *Kabuki* theatre and the urban demi-monde, both recorded by the art called *ukiyo-e*, especially in the form of the woodblock print. Some of the most famous

prints combine these two worlds and are portraits of the stars of the stage of the time – *Kabuki* actors. The establishment became increasingly concerned at the spread and success of the art form, and from 1789 all prints were censored and had to bear an official seal. It was not only the content which was restricted. The use of many colours was seen as too luxurious, a restriction which led to sophisticated developments in the technique of overprinting colours.

At the height of its powers, the woodblock business was well organised into a team enterprise consisting of artist, publisher, carver, and printer. The publisher generally ran the project, commissioning the artist, providing the materials and sometimes even premises. The finished drawing was taken to the carver, pasted onto a block and carved. This explains why so few originals survive. This keyblock was handed over to the printer who made 20 or so black copies which were then returned to the artist for indications of colours to be used. On each sheet he would mark the area to be printed using red (made from vermilion) ink and add a sample of the actual colour in the margin. Areas to be shaded would also be specified. It seems that the artists did not colour a complete print as a master. Once the colours had been chosen, the artist had little to do with the production.

The coloured copies would be returned to the carver's workshop where they would be pasted onto the blocks and cut. All the blocks would then be taken to the print workshop where a production line of printers would turn out the finished print; a rate of at least 200 a day was the average output per printer. Inevitably, as the edition progressed, the blocks would become saturated with pigment and the quality of the line would begin to deteriorate. The blocks were, however, often kept and printed again at a later date or sold on to another workshop. The finished prints would be trimmed, packed in bundles and dispatched to the publisher for sale. They were almost certainly sold quite cheaply from specialist shops or by street hawkers. They were not really seen as valuable items which perhaps explains the surprised reaction of the Japanese to the reception of the prints when first seen by Westerners.

The period from the early 18th to the mid-19th century covers the rise and fall of *ukiyo-e*. Harunobu and his early experiments with colour were followed by perhaps one of the greatest artists to depict beautiful women, Kitagawa Utamaro. He was not only a consummate artist but also technically innovative, demanding ever more sophisticated skills from both carvers and printers. His most ambitious technical achievement was to print a double-sided print showing the back and front of a beautiful woman (see illustration page 83). The outline is in exactly the same place on both sides: a true testament to the skills of the craftsmen but above all else an indication of what was possible using the *kentō* registration system. Utamaro's contemporary, Tōshūsai Sharaku, is known particularly for his daring close-up portraits of actors outlined against a

shimmering mica background. He left a significant body of work despite his very short career (see illustration page 113).

Although the early part of the 19th century is often cited as the beginning of the decline in *ukiyo-e*, this period does cover the working years of two of the greatest artists ever to have used the medium; Katsushika Hokusai and Andō Hiroshige. Possibly because of the constraints caused by government restrictions, both are known primarily for their magnificent landscape series. These prints also showed their openness to new ideas. The shaded skies/seas for which they are both well-known used the colour Prussian blue which had been imported from Europe and was beginning to be manufactured in China. The use of this new colour almost certainly boosted sales of these prints. There is also evidence in their work of limited contact with Western art, because some prints show early attempts to tackle the compositional problems of Western perspective.

It is generally accepted that the woodblock tradition began to decline after the Meiji Restoration in 1868 although some regard late Meiji and early Taishō as the peak of technical achievement. Aniline dyes were introduced from the West and were used to replace the gentler indigenous colours. As contact with the outside world introduced new inventions and other forms of printing, traditional woodblock began to lose its vitality. The revival of interest only came in the 20th century with the *Sōsaku Hanga* (Creative Print) movement when a new generation of artists began to use the technique. They were influenced by European ideas of the print as an artistic method rather than merely a means of reproduction. Two of the most well-known artists of this period were Onchi Kōshirō (1891–1955) and Munakata Shikō (1903–1975). The traditional division of labour was replaced by such artist/printmakers who were competent in all the processes. This inevitably changed some of the ways in which prints were made. A few of the more time-consuming tasks were simplified although the quality of the medium was maintained. The traditional materials were still used, and the new way of working revived some of the lost spirit of *ukiyo-e*. In the post-war period, a generation of artists, including Miyashita Tokio, Funasaka Yoshisuke and Kurosaki Akira experimented with mixing woodblock and etching and woodblock and screenprint which further broadened the range of the traditional technique.

The West has tended to have a rather narrow idea of the scope of the Japanese woodblock technique based mainly on its first exposure to *ukiyo-e* that arrived in Europe. Although these prints were seen as exotic works of art, in reality in Japan, woodblock was the main method of mass printing and the prints were considered of little value.

The way the technique was used in Japan also had regional differences. Kyōto printmaking grew out of the Kyōto textile industry. The technique



'in the habitation of dragons, where each lay shall be grass with reeds and rushes', Pamela Challis, Australia. Edition 7, 40 x 40cm, 1993. This work is printed on cream *kōzo washi* in the Japanese manner using ground pigments and a combination of fine and coarse *baren*. It is carved in six blocks made of a compressed manufactured material (Craft Wood) which is easy to carve but has little character. The print includes three simple *bokashi* gradations.

was originally used to reproduce pattern samples which would be circulated to select customers. This required a softer style of printing than was used in Tōkyō. This Kyōto style was also suitable for reproductions of Japanese-style paintings which employ carving and printing techniques that imitate as closely as possible the brushed effect. The pigment used in Kyōto is often mixed with *gofun* (white pigment) giving softer colours, and it tends to be thicker so it can also be printed over gold leaf. Tōkyō colours were much thinner and would not cover a gold leaf base. The Kyōto *baren* is also larger and the printing style softer than Tōkyō. The colours in Kyōto prints tend to build up on the surface whereas Tōkyō style printing uses a stronger *baren* and forces the colour into the fibres of the paper. In contrast to the Kyōto style, Tōkyō style printmaking is epitomised by the well-known *ukiyo-e* tradition. Even though the number of carvers and printers has declined rapidly, these differences can still be seen in the Tōkyō and Kyōto workshops following the traditional way of working.

The fate of these workshops, however, must be uncertain because of the shortage of apprentices so it seems likely that the long-term future of woodblock in Japan will rest with art school trained artist/printmakers. In addition, numerous foreign-born artists are working in Japan and elsewhere to keep the technique alive.



Traces in a Void, Kurosaki Akira, Japan. Edition 50, 55 x 55cm, 1982.

The motif for this print comes from brushstrokes. The print uses seven blocks in five colours. Repeated printings of pale *sumi* give the rich *bokashi* effect. This print uses Echizen *torinoko* paper and was printed by Kurosaki's late printer, Uchiyama Sohei.

Chapter 2

MATERIALS

*Wood, tools, sharpening, pigments, nori/paste,
brushes, paper, sizing, baren*



Wood

Traditional cherry

It goes without saying that the choice of wood is fundamental to the success or otherwise of a woodblock print. Japan was particularly fortunate in having plentiful supplies of *yamazakura* (wild mountain cherry, *Prunus serrulata*) which was perfect for the technique. The *yamazakura* has few flowers or fruit and the pith on the inside lining of each annual growth ring is the same density as the ring itself. The best planks come from trees grown on mountains near the sea, particularly on the Izu peninsula near Tōkyō. The grain from these trees was fine and even, the wood was relatively easy to carve yet highly cohesive and did not splinter. Cherry from too far north in Japan was considered tougher to carve and did not take the colour well.

Supplies of *yamazakura* are however, now diminishing rapidly. The wood tends to be harvested with other timber and then the best is selected for use as woodblock. As stocks are reducing, the trees are being felled from deeper in the mountains which adds to the cost of bringing them to the market.

Cherry wood was probably first used to cut lettered texts. These differed considerably from their Chinese antecedents. In Japan, it was considered more elegant to reproduce the fine cursive style of handwriting in wood, whereas in China, square-style letters were favoured. The Japanese copied this style for imported texts, but for indigenous texts they preferred to carve cursive lettering and this was only possible with wood of the highest quality and the finest grain. This combination of high quality wood and fine cursive carving is the origin of the skill and technique perfected in *nishiki-e*.

The fundamental difference between Japanese woodblock and its Western counterpart is that the block (*hangī*) is cut **down** the grain (not across it as in wood engraving) giving larger blocks. Also, because the knife is cutting with the grain, it makes possible the flowing line characteristic of the technique. The blocks cut from the hardest parts of the wood are reserved for cutting keyblocks, the softer parts for colour blocks as they take flat colour better. If at all possible all the blocks for one print would be



Left to right: *sakura* (cherry); *hō* (magnolia); *katsura* (*cercidiphyllum*); *shina* plywood (basswood plywood)

cut from the same tree thus improving the chances of them all behaving in the same way during printing. Straight grain was preferred to irregular grain as it was less likely to warp. It was not traditional for the grain to show in the prints although it is used as a feature by many contemporary artists.

Preparing the block (*hangi*)

The timber is dried for about two years before being rough cut into planks about twice the thickness of the finished block. They are left to season in the shade for several years. During this time, planks which warped or split were discarded. The time from the tree being felled to the wood's use as a block could be as much as ten years. Shrinkage of 3mm ($\frac{1}{8}$ in.) would be permissible for wood for general use, but in woodblock even 1mm ($\frac{1}{16}$ in.) can be too much. This low rate of shrinkage can only be achieved with a long period of seasoning.

Of equal importance to the quality of the original timber, is the planing process. Workshops in Tōkyō, Ōsaka and Kyōto specialised in preparing the blocks for printing. The seasoned timber was cut to size and then planed in three directions: vertically, horizontally and diagonally on both sides of the block. The surface could be finished by grinding with a *nagura* (fine whetstone) and rubbing with *tokusa* (horsetail or scouring rush from the *Equisetum* family). This process resulted in the almost grainless metal-like surface favoured for woodblock. The traditional finished block would be approximately 3.5cm (1 $\frac{1}{4}$ in.) thick, carved on both sides and durable enough to last. Mineral pigments would wear a block faster than using organic colours; in the latter case a hard block could survive 10,000 impressions. Blocks were often re-planed and re-used several times, sometimes ending up about half the original thickness. As cherry is so expensive, contemporary blockmakers are cutting and planing old blocks and using them to face plywood.

Working outside Japan it may be difficult to buy blocks prepared by experts and alternatives may have to be found locally. When preparing substitutes, care needs to be taken with the finishing of the block. Sandpaper appears at first to give an even surface but in fact the fibres are just flattened like brushed hair, and when the block becomes wet, the nap lifts, the pigment is trapped and prints unevenly. Scrapers, planes or razor blades, if used in several directions across the block, should give a better surface.

Other woods

Of course cherry was not and is not the only wood used. In China, printers used flat-planed pear, jujube, seasoned pine or catalpa (*azusa*). *Azusa* was possibly also used in the early days of printing in Japan as the word has entered the language to mean 'publish': a reference maybe to the beginnings of woodblock publishing of texts. Japanese printers also used *Magnolia obovata* (*hō*), *Cercidiphyllum japonicum* (*katsura*) and for particularly finely carved areas, boxwood (*tsuge*). Sections of box would be inserted flush with the surface of the block, for example, on the hairline of beauty prints to enable the carver to cut the ultra-fine lines. *Hō* is quite lightweight and good for small prints, having an easily carved, soft and uniform texture. *Katsura* has an even though slightly coarse texture, straight grain and is relatively free from shrinkage.

If you prefer to try carving block wood and Japanese woods are not available, there are various woods which can be substituted. Lime, maple, sycamore, pear, chestnut, American White Wood have all been tried. If the surface of the block is particularly hard, it was traditionally rubbed with sesame oil to soften it before carving. This may be worth trying. Woods like pine, cedar and zelkova (*keyaki*) can be used although they have a strong grain. To make an even stronger feature of the texture, brush the block in the direction of the grain with a wire brush. For a more pronounced grain the surface can be scorched. This technique can be used very effectively as a feature in parts of a print.

Plywood

Very few contemporary artists use traditional cherry as it is too expensive, hard to carve and the size of the blocks is inevitably limited. There is also little need nowadays to carve in a wood which will withstand thousands of impressions so most artists use plywood. It can also be carved on both sides if it is thick enough (9mm/3/8in. or more) to prevent warping. Thinner ply can be used but should be cut on just one side. Basswood, *Tilia japonica* (*shina*) is probably the most commonly used in Japan because it has some of the surface qualities favoured in *yamazakura*. It has a fine grain, is soft and easily carved and does not chip too badly. Also the grain is not too prominent when printed in flat colours. A medium weight

plywood with a more obvious grain is Philippine Mahogany, *Shorea negrosensis* (*Lauan*). It is also easily carved but can chip. If these plywoods are not available, it is likely that there is a local substitute. Quality birch plywood is adequate for most styles of working but probably not the best for cutting very fine lines.

It is worth trying most plywoods but check the surface for the fineness of the grain/texture and make sure that the layers are not glued with an impenetrable glue as carving beyond the top layer would be very difficult and would blunt the tools. If the surface is slightly rough and liable to chip it can be treated with a glue/water mixture. Mix wood glue and water in a ratio of three parts glue to one part water and then paint it evenly on the plywood just once. Allow the wood to dry completely and then if necessary lightly scrape the surface with a sharp blade. It should hold together better and splinter less easily.



Left to right: *sakura*; *hō*; *katsura* faced plywood

Alternatives

Chipboard, hardboard and MDF can all be carved but because of the way they are constructed they lack any character and this tends to show in the final print. These woods can also be tough on the cutting tools which will need regular sharpening. The beauty of the traditional technique lies in the quality of the block, the way the wood takes the water-based pigments and how they are absorbed in turn by the soft *washi*. Taking the time to experiment with different woods which are easily available locally should yield valuable information when choosing the right wood for the right print.

Lino

As the techniques are similar, lino blocks could be used with the Japanese method though it would be hard to brush water-based colour. There is no reason, however, why an oil-colour lino-block (or woodblock) could not be inked with a roller and registered as part of a print. It would have to be printed last, as the water-based colours would not easily overprint the oil-based colour.

Care of woodblocks

Traditional blocks would often be clamped at either end to stop warping, but these clamps made it harder to use the *baren* effectively. Blocks which have warped can be straightened by wetting them with water and drying them under a weight until flat. While carving, it is also important to protect the reverse of the block with a sheet of card or cloth. If the surface is damaged it will have to be re-planed before it can be used.

After printing, the blocks should be washed carefully (an old toothbrush is useful) to remove traces of colour, then dried, wrapped in newspaper and stored vertically away from direct heat or light.

Tools

The best quality Japanese woodblock cutting tools are expensive but they will withstand years of use and sharpening. The blades are formed in the same way as traditional swords and have similar cutting qualities. The secret lies in their layered construction. High-carbon, hard steel which takes the cutting edge is laminated to softer steel which gives the support. The resulting blade combines strength with flexibility. In the final stages of manufacture, the hot laminated blade is plunged into cold water which further hardens it. The blades are then given their final shape and sharpened by hand before being fitted with wooden handles. The blades

of the best tools extend up into the handle which opens to reveal extra blade to be sharpened when needed. There are sets of cheaper tools available which are perfectly adequate for beginners but the blades are poorer quality and tend to need frequent re-sharpening. If at all possible it is worth investing in a small selection of the best quality tools. Although they are more expensive, less time will have to be spent on sharpening.



Sharpened blades before they are fitted with handles.

Small tools

Hangitō (knife)

The most important tool of all is the *hangitō* (also called *kiridashi*). The skillful use of this knife alone is responsible for producing the delicate flowing lines characteristic of Japanese prints. All the outlines in a print

are carved with a *hangitō* and until the introduction in the 19th century of other shaped blades, it was effectively the only tool used for cutting. It is held upright like a dagger with the thumb over the end of the handle and the middle finger or thumb of the other hand steadying the blade. Only the tip of the blade should cut the wood (at an angle of about 35° to the vertical) and for that reason it needs to be kept very sharp. The bevel should face the area to be kept. Unlike all the other tools it is drawn **towards** the carver (see photographs page 71). The readily available knives are all for right-handers. Left-hand knives can be ordered from the makers. Professional carvers keep a variety of *hangitō* with blades of varying widths and angles for different jobs.

Unlike the *hangitō*, the following three tools are used **away** from the carver and kept bevel side down at a shallow angle (about 30°) to avoid digging into the wood. The blade is steadied by the fingers of the left hand (see photograph page 74).

Sankakutō (V-shaped gouge)

The *sankakutō* is undoubtedly a Western-influenced cutting tool and was not originally used by *ukiyo-e* carvers. All lines produced by the *hangitō* need two cuts, but a line can be cut in a single action using the *sankakutō*. The quality of the cut line is of course different and does not have the subtlety of a good *hangitō* line. It can also be used to produce patterns and textures.

Komasuki (round gouge)

The *komasuki* is a small semi-circular gouge used for clearing around the areas carved in outline using the *hangitō*. Clearing starts with a small gouge and then a larger gouge would be used further away from the

Top left to right: two *aisuki* (one with handle open to show blade); two *hangitō*
Bottom left to right: long-handled *hangitō*; two *sankakutō*; two *komasuki*;
two *marunomi*; *sōainomi* *kentōnomi*; mallet



printing area. It can of course also be used in its own right to produce a soft line or texture directly in the wood.

***Aisuki* (flat-bladed chisel)**

The *aisuki* is like a small flat-bladed chisel with a slightly curved tip and is used mainly to tidy up the cleared areas. *Aisuki* of varying sizes are kept by the carver to fit the different spaces in the block. For areas wider than about 1.5cm ($\frac{3}{4}$ in.) a larger chisel would be used. The *aisuki* can also be used to chamfer the edge of a carved shape (known as *itabokashi*) so that when printed the colour appears to fade as in printed gradation (see page 98). It is also useful for softening the edges of the cleared areas.

Large tools

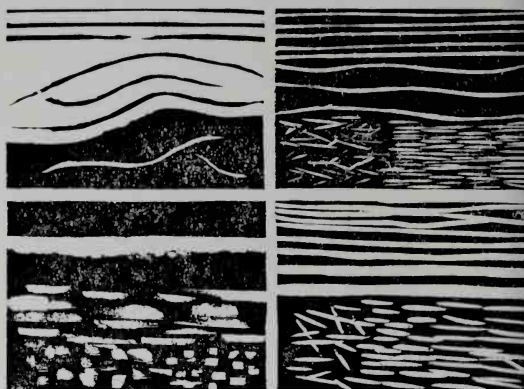
In addition to the above four tools, larger chisels (*nomi*) are needed to complete a basic set. The *hangitō*, *sankakutō*, *komasuki*, and *aisuki* are designed to be used exclusively by hand whereas the *marunomi* and *sōainomi* have a metal ring on the end of the handle so that they can also be used with a wooden mallet. When using the mallet, it is important to watch the blade and not the handle.

***Marunomi* (large round chisel)**

The *marunomi* is a large version of the *komasuki* and is used in the same way but for clearing bigger areas. The chisels should also be held at a shallow angle especially when using them with a mallet. It is easy to 'dig' large holes by mistake. They are generally available in two profiles: deep and shallow.



Close-ups of the four main cutting tools: 1 *hangitō* 2 *aisuki* 3 *komasuki* 4 *sankakutō*

*sankakutō**hangitō**komasuki**aisuki**hangitō**sankakutō**aisuki**komasuki*

Cutting marks made by the four tools (left) and printed in black and white (right).

Sōainomi (clearing chisel)

The *sōainomi* is a larger version of the *aisuki* and is used to tidy up the ridges left after clearing with the *marunomi* and for chamfering edges.

Kentōnomi

The final chisel in the set has a completely straight edge to the blade and is only used for cutting the *kentō* (registration marks). The *kentōnomi* has a shorter handle than the other chisels and is designed to be hit with the hand rather than a mallet (see photograph page 79). Instead of a *kentōnomi* a flat chisel or an *aisuki* can be used.

A basic set of tools would include the following:

<i>hangitō</i>	6mm
<i>komasuki</i>	4.5mm
<i>aisuki</i>	4.5mm
<i>sankakutō</i>	3mm
<i>marunomi</i>	12mm shallow, 6mm deep
<i>sōainomi</i>	18mm
<i>kentōnomi</i>	standard size (approximately 15mm)



A wooden mallet is also needed for use with the chisels. Other sizes of frequently used tools can be added as the budget allows.

Close-up of a carved Japanese text block (origin unknown).



Top: small whetstone with groove for curved tools; shaped slipstones
 Above, left to right: *arato* (rough); *chūto* (medium); *shiageto* (fine)

Sharpening

Whetstones

There are two types of stone used for sharpening; those which are used with oil as in the West and those used with water. Traditional Japanese whetstones (*toishi*) are placed on a wooden base or damp folded towel and are always used with water. They come in three grades of roughness/hardness and can be either man-made or natural. It is thought that three stones were traditionally used because Japan's volcanic geology did not yield a true hardstone.

Arato (coarse)

This stone is used for re-grinding very damaged blades or for changing the angle of a blade. The stone will need to be well-soaked and rinsed frequently during use or it will clog with metal particles.

Chūto (medium)

This stone is probably the most frequently used to maintain the condition of the blade. It needs to be well-soaked in water.

Shiageto (fine)

As the *shiageto* is very hard, it works better with a slurry on the surface. It is used to put the finishing touches to the blade and to remove the burr caused by sharpening.

Slipstones

Cylindrical and triangular slipstones are useful for finishing the inner edge of the shaped blades.

Nagura

The *nagura* is a hard stone used, if available, for preparing the surface of the woodblocks and on the whetstone to build up slurry.

Maintaining the whetstones

If the surface of the stones becomes dented from repeated use, it can be restored by soaking with water and rubbing against another surface. The *arato* will need to be rubbed against something rough like a concrete block; the *arato* can then be used on the *chūto* and, in turn, the *nagura* on the *shiageto*. A fair amount of water will be needed to wash away the slurry produced.

Re-forming a damaged blade

If a blade has been very badly damaged or snapped, then all three stones will be used to re-form it.

Arato

The blade has to be roughly re-shaped before it can be sharpened for use. It should be held upright on the *arato* and moved backwards and forwards until the original silhouette has been restored.

Chūto

The *chūto* is then used to re-form and refine the bevel on the blade. It is important to hold it firmly at exactly the right angle on the stone (see following sections). As the blade is moved to and fro and the stone is flushed with water, a slurry builds up on the surface which helps in the sharpening process.

Shiageto

The *shiageto* finishes and brings a final polish to the blade and removes the burr on flat-bladed tools. Slipstones are used to remove the burr on shaped tools. If a blade is not badly damaged, but merely blunt from use, it will only need sharpening on the *chūto* and finishing on the *shiageto*.

Flat-bladed tools (*hangitō, aisuki, sōainomi, kentōnōmi*)

When sharpening these tools, the angled front side of the blade should be held firmly on the stone with the index finger and the tool moved to and fro. Check the blade from time to time and when you can feel that a burr has formed on the reverse, turn the blade over and draw it gently across the *shiageto* a few times to remove it. The front should then be given a final polish on the *shiageto* and the burr removed as before. The method of

Flat-bladed tools



The bevel (front) of the blade is sharpened on the *chūto*.



The back of the blade is pulled across the *shiageto* to remove the burr.

V-shaped tools



The blade is sharpened on the *chūto*, alternating sides to maintain the 'V'.



The burr on the inside of the blade is removed with a triangular slipstone.

Round-bladed tools



The blade is rocked to and fro in the groove in the *chūto*.



The burr on the inside of the blade is removed with a circular slipstone.

holding and sharpening the tool is the same on both stones, though the final strokes should always be on the *shiage*to.

V-shaped gouge (*sankakutō*)

The V-shaped gouge is sharpened in the same way as the flat-bladed tools but by alternating between the two sides of the V to make sure that the point of the blade does not end up off centre. Take care to hold the tool firmly at the angle of the bevel. A triangular slipstone will take off the burr on the inside.

Round-bladed tools (*komasuki*, *marunomi*)

The easiest way to sharpen the rounded blades is to use a whetstone which already has grooves in it, or if that is not available, a groove can be worked into the *chūto* with the head of a nail. The blade should be held in the groove at the angle of the bevel and worked to and fro, rolling it slightly at the same time. A round blade can also be sharpened on a flat stone by holding it at the correct angle and rolling it backwards and forwards, though this takes more practice. A small round slipstone is needed to remove the burr on the inside.

Maintaining the blades

It is very important to look after the blades and keep them sharp and ready for use. When looked at end-on, a blunt blade will reflect a sliver of light which disappears when sharp. Carvers have a set of whetstones to hand and constantly refresh the blades while working. When the tools are not being used, and especially after sharpening, the blades should be wiped with a little machine/vegetable oil (traditionally camellia oil would be used) and kept protected in a cloth tool holder or the drawers of a small chest.

Pigments

The colours used for traditional Japanese woodblock are always water-based, of varying degrees of permanence and are divided into two groups: inorganic (mineral) and organic (vegetable). They are generally mixed on the block with rice paste (*nori*) which acts as a medium.

The four basic colours of Edo woodblock were black (*sumi*), yellow, blue and red. Other colours were achieved by mixing or overprinting. It can be very hard to discern the original colour palette used in prints as over the years colours have faded and the paper has often yellowed. The first change in this palette came with the introduction of Prussian blue followed by the import of harsh aniline colours from the West in the Meiji period (1866–1912). There is still considerable confusion as to names and the exact composition of the original colours used but the following list will give an indication.

Black

Sumi

Sumi is arguably the most important colour in Japanese woodblock and is the only black used. It is made from burning pine or rapeseed oil to produce soot which is kneaded into a stick with glue (*nikawa*). *Nikawa* is the traditional Japanese animal glue/binder and size. The colour of *sumi* varies depending on the quality of the stick and the soot from which it is made, a blue-green cast being favoured.

When *sumi* is used for writing or painting the ink stick is rubbed on a *suzuri* (inkstone) with a little water until the required strength is achieved. For printing, leftover sticks were soaked in water for three to four days (with the water changed each day) until most of the *nikawa* had leached out leaving a matt black pigment. For a glossy lacquer black (often seen in prints as detail on hair) ink from a stick was used, or *nikawa* was added as the binder which gives the shine.

The most practical form of *sumi*, however, is a liquid called *bokujū*. It is a very strong black, relatively inexpensive and can be thinned to give the palest grey. Japanese *bokujū* is more expensive than its Chinese equivalent which is also suitable for use.

Red

Tan

This was the earliest red/orange colour used to hand colour black and white prints after 1700. It was made from red oxide of lead and was originally used as pigment on architecture and sculpture. It tends to darken over time.

Suō

This is a darker red made from the bark of sappanwood (*Caesalpinia sappan*) used in early hand-colouring.

Beni/enji

Beni is a very fugitive red/pink made from the dried petals of a variety of the dyer's thistle, safflower (*Carthamus tinctorius*) called *saiku beni*, mixed with an acidic liquid derived from the half-dried outer layer of the stones of Japanese plums (*ume*) and allowed to ferment. The mixture is then dried into cakes in the sun. From around 1715 it was used in hand-colouring even though it was almost as expensive as gold. It seems that the brushes used were not washed for that reason!

The name *enji* is sometimes used to refer to *beni* but also to a crimson colour originally introduced from China and said to be the juice of *otogiriso* (*Hypericum erectum*, St John's Wort). By the Meiji period it seems that it was actually made using a red from the lac insect, imported as red dyed cloth from China.

The felt was soaked in water, pressed and the resulting pink water was evaporated until nearly dry then used as pigment. It was not permanent in sunlight.

Shu

Shu is vermilion made from mercuric sulphide from the Shinshu province of China. It was a very expensive pigment and tended to discolour. It should be mixed on the block with *nikawa*/gum arabic rather than *nori*.

Benigara

This is made from red oxide of iron; the Japanese name derives from 'Bengal' where the oxide came from. It was used thinned for faces and skin in Edo prints.

Yōkō

This was a cheap carmine from Europe used in later prints.

Akane

A Japanese madder made from the root of *Rubia akane*.

Yellow/brown

Tōō (also *shiō/kusashiō*)

Tōō is gamboge, a bright yellow made with gum from the tree *Garcinia morella* native to Burma and Thailand. Gamboge is not a reliably permanent colour and tends to fade, though if kept in the dark it seems to recover some of its colour. It is also very poisonous.

Ukon

Ukon was a strong yellow made from the rhizomes of turmeric (*Curcuma longo*) which grows in Kyūshū and Okinawa. It is very fugitive.

Zumi

Zumi was a mustard yellow/green made from boiling the bark of *Malus toringo*. The colour deepens as time passes.

Kihada

This was a creamy/yellow made from the bark of the Amur cork (*Phellodendron amurense*).

Kuchinashi

A transparent reddish/yellow made from the berries of *Gardenia florida*.

Kiō/sekishiō/sekio

This yellow was made from orpiment (arsenic trisulphide) and gave an opaque colour good for overprinting. It is very poisonous and so is no longer used.

Ōdo

This was yellow ochre made from yellow earth.

Taisha

This was a red/ochre made from burnt iron and manganese-bearing earth. The name comes from the Taishu province of China. It is similar to Burnt Sienna.

Blue***Tsuyugusa/aigami***

This was a very fugitive light blue derived from the crushed flower petals of the *tsuyugusa* (*Commelina communis*). Paper (*aigami*) dyed with the blue was soaked in water to extract the colour.

Ai

Ai (indigo) is a deep rich blue from the *Polygonum tinctorium* plant. It was obtained for printing by soaking the colour out of dyed rags. Sticks of indigo colour (*aibō*) were also produced. These were ground on a stone like *sumi* (ink sticks). Indigo is not as fugitive as *tsuyugusa*.

Berō-ai

This was the name given to Prussian blue imported from Europe and also China to replace organic blues which lacked permanence. In the late 1820s Prussian blue was famously used for the shaded skies in Hokusai's 'Thirty Six Views of Mount Fuji' and its novelty contributed to the popularity of the prints.

A collection of *fuda* (name cards/advertisements) using a variety of carving and printing techniques.



Gunjō/konjō

This was an ultramarine-like blue made from ground azurite. It should be mixed with *nikawa*/gum arabic on the block rather than *nori*.

Green

Green was usually made by mixing (printing the yellow first) but there were two natural greens.

Rokushō/byakuroku

This was made from ground malachite (carbonate of copper). In Japan and China the pigment was coarsely ground thus preserving the colour; in the West it was paler because it was ground more finely. As it is a grainy pigment it is quite hard to use, and should be mixed with *nikawa*/gum arabic on the block rather than *nori*.

Dōrokushō

A green made from aceto-arsenite of copper (verdigris).

White

Generally paper was left blank to give white but pigment was used on its own (for snowflakes for example) or mixed with colours.

Gofun

The Japanese word *gofun* literally means 'foreign powder' as it was probably introduced from China. This white is made from ground calcined clam/oyster shells and can be mixed with colours using *nikawa* rather than *nori* to give opacity and thickness. This is more common in Kyōto-style prints.

Enpaku

This is made from carbonate of lead introduced from the West into China. It tends to darken over time.

Other colours

Using this basic repertoire of pigments, other colours could be mixed.

<i>Tsuyugusa</i> and <i>beni</i>	=	<i>murasaki</i> (purple)
<i>Beni</i> and <i>sekiō</i> or <i>benigara</i> and <i>sumi</i>	=	<i>kakiro</i> (yellow/brown)
<i>Sekiō</i> and <i>shu</i>	=	<i>chojiro</i> (pale yellow/red/brown)
<i>Tsuyugusa</i> and <i>sekiō</i> or <i>zumi</i> and <i>ai</i>	=	<i>kusairo</i> (green)
<i>Zumi</i> and <i>benigara/beni</i>	=	<i>daidairo</i> (orange)

Powder colours

Gold, silver and particularly mica (*unmo*) powders were all used to great effect in traditional prints. They are applied by printing a blank block with *nori* or *nikawa* and sprinkling the powder on while the surface is still wet (see page 112).



Left to right: sets of Japanese pigments; sticks of *nikawa*; rice paste (top); *sumi* and *suzuri* (bottom)

Choosing and using pigments

Water-based colours

Although traditional colours were all mixed by the printer for each print, using the pigments outlined above, most contemporary artists use ready-made colours. *Sumi* (ink) is undoubtedly the best black but for all other colours, tubes of watercolour or gouache are fine and even poster colours can be used though their permanence is questionable.

By using both gouache and watercolour in the same print, interesting effects can be achieved by exploiting the opacity or translucency of the respective mediums. Acrylic colours do not work particularly well. Water-based printing inks are not really suitable for the Japanese brushing method of applying colour as they are designed to be used with a roller.

For large prints in large editions, however, using commercially available colours will be expensive and it may be worth mixing your own from powdered pigments (*ganryō*). This also gives greater control over the amount of medium and filler used. Mixing colours is not as difficult as it seems and a batch can be made in advance and stored for future use.

Mixing

To make your own selection of colours, the powder colours (*ganryō*) should be ground finely in a pestle and mortar with a small amount of water. Some colours such as indigo and carmine resist water so a little industrial alcohol needs to be added before they will mix. A small amount of binder (about one fifth of the quantity of pigment) such as gum arabic or the traditional *nikawa* is added (see page 47) and then the mixture is

ground again. It can be thinned with water to make the right consistency for printing. The colour is ready for immediate use or it can be stored, covered for later. If it dries out, it has to be re-ground with a little water. If the pigment is kept too long *nikawa* goes off and the mix has to be thrown away, although gum arabic does not have this problem.

Alternatively, powders can be ground with alcohol and stored in sealed jars as a paste ready to be diluted and used. To make a colour opaque, a little white can be added. When handling powdered colours, it is wise to take safety precautions (masks and gloves).

Oil-based inks

Oil-based inks were not used in traditional Japanese printing and are unsympathetic to the nature of Japanese paper, although this does not mean that they cannot be used. The block would have to be inked up with a roller (avoiding inking up the *kentō*) and, of course, that particular block would not work well with water-based colour afterwards. The paper should be damp as normal otherwise the registration will be out. Overprinting water-based colour onto oil-based can also be difficult so oil-based inks are best used as the final block, perhaps to highlight one part of the finished print.

Nori/Paste

Nori (or an equivalent) is very important in the woodblock process for pasting the original drawing (*hanshita*) on the block (see page 65) and in the use of colours. A small amount of *nori* is mixed on the block with the pigment using the printing brush. The addition of the paste acts as an extender, giving body to the colour and resulting in a more uniform, richer but matt colour. It also acts to slow the drying of the colour and the added thickness helps force the colour into the paper with the pressure of the *baren*. *Nori* also plays a small part in holding the paper in place during printing. Watery pigment printed without *nori* gives a speckled texture called *gomazuri* (see page 108). Too much *nori* mixed with the pigment will stick the paper to the block if the printing takes too long. Moderation is the key.

At first it will be hard to gauge the right amount of *nori* to pigment, but very soon you will develop a feel for it. If the printing brush leaves noticeable brushstrokes when mixing, then there is clearly too much *nori* and there is a danger that the surface of the block will become clogged with paste and need washing. After a few printings there will probably be enough pigment/*nori* held in the brush and on the block for several impressions. Only add more *nori* when the colour is re-loaded onto the block. It is also important to wash the blocks carefully after use to prevent the pigment/*nori* mix drying in situ and clogging the grain of the wood.

Recipe

The many recipes for making *nori* often involve soaking, cooking and straining rice. Although this is the traditional method, trying to achieve consistency with different types of rice in different parts of the world is very difficult. A simple alternative is to use rice or wheat flour in a proportion of 1 of flour: 8 of water. This ratio may vary slightly depending on the flour. Mix the flour to a smooth paste with a little of the water. Boil the remaining water in a heavy-bottomed pan and slowly add the paste – mix and stir constantly. After about five minutes it should start to thicken and turn translucent, though there may still be a few white specks. At this stage, the starch is at its strongest. Take the pan from the heat before it is allowed to boil and continue stirring as it cools. Plunging the pan in cold water will speed the process up a little.

Nori for pasting the *hanshita* to the blocks needs to be fairly thick (like cold cream) but for mixing with colour, add some water until it pours like single cream. If the paste becomes lumpy it can be pushed through a plastic sieve (a metal sieve risks contamination). The problem with *nori* is that it does not keep very well; a few days in the refrigerator is the limit so it is better to make small batches when needed. Formaldehyde can be added to help extend the life of the *nori*, but it may be difficult to obtain and is not recommended. A starch-based bookmaker's/conservator's paste in powder form, available through specialist stores, is the easiest option.

Brushes

Mixing brushes

In the traditional woodblock method, various types of brush are used. As the pigment is mixed directly on the block with the paste, the nature of the brush plays an important part. The hair used should be fairly firm and springy but with soft, split ends. The split hairs help to hold the colour well and do not leave streaks in the pigment on the block.

Hake and *marubake*

The Japanese brush (*hake* pronounced *haké*) is made from mane or tail hair from a live horse, bound in cherry bark and mounted into a bamboo handle. The hairs are very densely packed and should not shed during use. Cheaper alternatives (often used for textiles) are made from deer hair but are quite adequate for printmaking. *Hake* are available in varying sizes but for larger prints *marubake* (otherwise known as *burashi* from 'brush') tend to be used. The *marubake*, which looks exactly like a shoe or clothes brush, was imported into Japan in the Meiji period (1866–1912) and copied using the same horse hair as *hake*.

A combination of *hake* and *marubake* in a variety of sizes is adequate for most prints. If possible it is better to keep a brush for each colour,



Brushes (clockwise from top left): *hake*; *dōsabake*; *mizubake*; paintbrush; wallpaper brush



Top left: two *marubake* Bottom left: shoe brush
Other tools from left to right: Chinese brush; *tokibō*; two *hake*; two stencil brushes

particularly for black as it is difficult to clean. The brushes should always be washed thoroughly after use and dried with the bristles hanging downwards (*hake*) or on their side (*marubake*).

If the Japanese brushes are unobtainable, then shoe or clothes brushes, nail brushes, paint brushes and stencil brushes can be used instead. Cheap Chinese calligraphy brushes can also be tied together in bundles and used as a substitute.

Splitting the hairs

The ends of the hairs on traditional brushes are split before use (and to rejuvenate the brush while working) by rubbing vigorously on a stretched sharkskin until they are like velvet. Sharkskins are available through specialist suppliers in Japan but may need to be stretched onto a board. The sharkskin should be soaked overnight in water until it is soft and then attached to a varnished board. Traditionally it was nailed on with broad-headed nails, but now water-resistant glue is often used. One sharkskin will probably last a professional printer at least ten years. Alternatives to sharkskin are not easy to find, but it is worth trying coarse wet and dry paper, Dragon Skin (steel sanding sheet available in the US) or a concrete block. Many brushes exported from Japan already have split hairs, so a sharkskin may not be necessary.

To split the ends of a new brush, it should first be soaked in water for about one hour or the hairs will be brittle and likely to break. Some printers singe the ends of the hairs with a candle before splitting them to give a rounder profile to the brush. Singed ends are easier to split, but this method will use up more of the hair and the brush will have a shorter life. Instead of a candle, the ends can be singed on an old baking tray over a hot-plate. To stop the brush splaying while it is rubbed, the body of the brush can be tied tightly with string. Holding the brush firmly in both hands it should be rubbed hard against the grain of the sharkskin well lubricated with water (see photograph above). It can take as much as twenty minutes per brush so it is no wonder that apprentices were often



Splitting the hairs of a *marubake* on a sharkskin.

given the job! The brush should be washed thoroughly before use. Printers are very aware of the condition of the brushes they are using and will often re-split the ends of the hairs to improve the take-up of the pigment. Fine pigments such as *sumi* do not wear out the brushes as quickly as coarser mineral colours.

Other brushes

Hakobi or *tokibō*

The other traditional brush used in the printing process is called a *hakobi* or *tokibō*. It is often home-made using the leftover bamboo sheath from re-covering the *baren*. Short strips of bamboo leaf (3cm/1½in. long) are tied with string to a wooden handle (an old chopstick is ideal). The *hakobi* is used solely for transferring the pigment from the dish to the block. It is



Open Arc 2, Moya Bligh, Ireland. Edition 20, 32 x 46cm, 1996.

This print uses just two blocks, red and grey. The left side is printed on the back (*urazuri*) so is a reverse of the right side. The dark lines are achieved by scratching hard into the wood so that it absorbs more ink and prints a little like an intaglio line. The print is on hand-made Korean paper and is laminated to a backing sheet.

important to use a separate brush for this so that the amount of pigment being transferred to the block can be carefully controlled. If the *hake* was to be dipped directly into the pigment, it would quickly become saturated with colour and it would be hard to gauge the quantity needed for each impression. If *hakobi* (*tokibō*) are not available, ordinary paintbrushes or cheap Chinese calligraphy brushes can be used instead.

Dōsabake* and *mizubake

For applying size (*dōsa*) to the paper or dampening it prior to printing, a broad soft brush is needed. Traditionally a *mizubake* (water brush) or *dōsabake* (size brush) is used. Both brushes are at least 12cm (5in.) wide and made from goat or sheep hair. The hair in the brush should be quite dense and absorb a quantity of liquid allowing for fewer strokes across the paper. The brushes should be washed and hung to dry with the hairs facing downwards. If these *hake* are unavailable a wallpaper brush or broad paintbrush can be substituted.

Paper

The group of four trades involved in the production of a woodblock print (artist; publisher; carver; printer) should really be expanded to acknowledge the contribution of the papermakers of Japan. Water-based woodblock printing would have been impossible without sophisticated technical developments in the methods of paper production. Papermaking originated in China in the first century and spread east and west from there. The fibres used in China were mostly bamboo, hemp, bark, paper mulberry (*kōzo*) and cotton and the technique used was what has come to be called the *tamezuki* method. In this method the liquid is in the vat with the fibre in suspension and is scooped onto a screen and then left to drain. The fibres settle in a fairly even way. This method, however, would not produce paper with the qualities needed for Japanese woodblock.

As the technique developed in Japan, papermakers started to explore the use of indigenous materials and discovered the three main fibres still used today; *kōzo* (paper mulberry, *Broussonetia Kajinoki* Sieb), *gampi* (*Diplomorpha Sikokiana*) and *mitsumata* (*Edgeworthia chrysantha*). The most significant development, however, was in the actual method of forming the sheets. Instead of scooping up the water and fibres and allowing the sheet to form as the liquid drained, the Japanese technique (called *nagashizuki*) was far more vigorous. The deckle (wooden frame on which the sheet is formed) is dipped repeatedly in the vat and the liquid is rolled and agitated across the surface of the screen, matting the fibres together and resulting in a much more durable sheet of paper. This method of forming the sheets would not be possible without the addition of *neri* (a mucilaginous thickener) to the liquid which holds the fibres in suspension and slows the draining process.

Sophisticated multicolour woodblock prints using water-based pigments only became feasible because of the nature of Japanese paper (*washi*) formed by the *nagashizuki* method. Because of the long fibres the paper expands and contracts evenly when wet and dried and is able to withstand numerous printings and repeated dampening, without throwing the registration completely. The paper surface is also soft and smooth and draws the pigment in. These qualities are virtually impossible to find either in a cheap substitute or in Western style paper. Good quality paper is undoubtedly an expense which cannot be avoided but to save money test prints can be done on cheaper paper and only the final work on the best.

Fibres

Kōzo

Kōzo is a deciduous perennial of the *Moraceae* family (commonly known as paper mulberry) and is the most widely used and longest of the three fibres. Good drainage is important for its cultivation and it needs to be protected from strong winds although it can grow well in colder areas. It grows mainly in the west/central areas of Japan and in the prefectures directly north of Tōkyō. The supply of *kōzo* can barely keep up with production nowadays and so it is often imported, especially from Korea. *Kōzo* is harvested either after leaf drop in the autumn or in the spring before leaf growth starts. As the *kōzo* is cut annually it is effectively coppiced and the plants never reach much more than 2m (78in.) high.

Gampi

Gampi is the oldest of the three fibres, dating back to the 8th century, and in many ways is the hardest to use. It is a perennial shrub belonging to the *Thymelaeaceae* family. Unlike *kōzo*, the cultivation of *gampi* is extremely difficult and it is generally collected from the wild. It is indigenous to Taiwan and the Philippines and only grows in the temperate (central to southern) regions of Japan.

Gampi is becoming increasingly scarce, a fact which threatens the production of this distinctive paper, particularly valued for its translucence and sheen and now very expensive. The best *gampi* fibre is harvested from 5–6 year old plants cut in the spring before the buds sprout. *Gampi* fibres are short but produce an exceptionally strong paper resistant to both humidity and insect attack.

Mitsumata

Mitsumata is the third and most recently discovered of the commonly used fibres in Japan. It comes from a deciduous shrub also belonging to the *Thymelaeaceae* family and has been in use since the late 16th century. *Mitsumata* can survive in harsher climates than *gampi*, but is not as resilient to cold as *kōzo*. It mainly grows in Shikoku and central Japan particularly on the north-facing slopes of mountains and in valleys. It

needs fairly plentiful rainfall. *Mitsumata* is harvested between November and March.

Other fibres

Bamboo, straw and rice straw have all been used in the past to make paper or added to bulk out other fibres. The persistent misnaming of Japanese paper as 'rice paper' has no basis in fact. Hemp has also been used in the past but is rarely used today.

Harvesting and preparation of the fibres

Once the shrubs have been cut, the bark has to be stripped from the inner core. The hard work of stripping (usually after steaming) has to be done by hand. The peeled bark (*kurokawa*) is tied into bundles and hung out to dry before any attempt is made to separate the white inner bark (*shirokawa*) used for paper from the *kurokawa*. *Kurokawa* can be used to make rough paper and it is occasionally added as a special effect in craft papers.

The traditional way to remove the outer bark is by soaking the bundles in a shallow river and trampling them to loosen the outer layer. The inner and outer bark are then separated using a sharp knife on a block. The precious inner bark is washed thoroughly to remove any specks of outer bark or dirt, then bundled up and dried in the sun hanging over bamboo poles.

Shirokawa at this stage is, however, still a long way from being ready for use. Further impurities have to be removed by boiling, bleaching or picking out by hand. To remove soluble impurities such as starch, tannin and pectin, the bark is boiled in a large cauldron in an alkaline solution such as caustic soda, though traditionally wood ash was preferred. Experts claim that ash gives a softer colour and feel to the paper.

After boiling, the fibres again have to be washed thoroughly. To make pure white paper with little risk of discolouration over the years, the fibres need to be bleached further. In some areas they are left out in the snow or sun, otherwise chemicals are used.

The next stage is generally regarded as one of the worst jobs and often falls to the elderly women of the village. The fibre, floating in cold water is picked over by hand to remove any remaining specks or impurities. To make the finest papers this process is carried out two or three times. It has been possible to mechanise the cleaning of *gampi* and *mitsumata* because the fibres are shorter, but *kōzo* still requires this labour-intensive process. To produce fibres of roughly equal length and size, they need to be separated. This also used to be done by hand but nowadays, after an initial beating with a mechanical beater (stamper), the fibre is often finished off in a *naginata* beater: so-called because the blades are the same shape as a Japanese halberd (*naginata*).

Right: bundles of harvested *kōzo*.

Bottom left: *shirokawa* washing in the river.

Below right: picking out impurities from the fibre.



The prepared fibres should be free-floating, smooth and regular, resulting in the uniquely strong yet soft quality of *washi*. They are then added to water together with a vital ingredient in the preparation of the mixture, *neri* or mucilage. The addition of *neri* thickens the water and holds the fibres in suspension. As the liquid drains while forming the sheet of paper, the *neri* slows the process down, allowing very thin translucent sheets to be formed. Without the addition of *neri* to the fibrous pulp solution the unique Japanese method of *nagashizuki* would not be possible. The most commonly used *neri* comes from the root of the *tororoaoi* plant (*Abelmoschus manihot* Medikus) and it has proved remarkably hard to imitate artificially.

Forming sheets

The liquid with the fibres in suspension is poured into a vat (*fune*) which is traditionally made of cypress or spruce. The sheet itself is formed on a wooden deckle (*keta*) which is lined with a fine slatted bamboo gauze (*su*) held together with silk thread. The water drips through the gauze and leaves a thin sheet of paper resting on the top. The marks of the bamboo can often be seen in the finished sheet by holding it against the light. To make the finest papers such as *gampi*, a silk gauze (*sha*) is attached over the bamboo slats to reduce the bamboo texture left on the sheet.

There are three stages to making a sheet of paper using the *nagashizuki* method:

- 1 liquid is scooped up into the deckle from the vat
- 2 the deckle is agitated to form an even sheet
- 3 the excess liquid is tossed back into the vat

The first scoop of liquid into the deckle is all important in deciding the quality of the final sheet. Subsequent dippings build up the thickness. The agitation of the liquid while it is on the deckle determines how the fibres become entangled and the nature of the paper formed. The best quality paper is made by strong rolling movements which take long experience to perfect.

When the sheet on the *su* has reached the desired thickness, the excess liquid is carefully tossed back into the vat, taking with it any spots or impurities which may have surfaced during the process. The *su* is removed from the deckle, the sheet is laid on top of the pile of finished paper (*shito*) and the *su* is peeled off the back. One of the mysterious properties of the *neri* is that it prevents the sheets on this pile from becoming one solid mass. The *shito* is left to drain slowly as the sheets still contain a high proportion of water. Later, weights are added to complete the draining process.

The final stage is to dry each sheet individually. The traditional method is sun drying on wooden boards such as cypress, ginkgo or pine. On some sheets of paper the grain of the wooden drying board can be seen clearly.



Left: agitating the mixture to form a sheet on the deckle.

Below: transferring finished sheets to the pile (*shito*).





Mount Fuji in Autumn, Onchi Kōshirō, 289 x 201mm, 1946.

This print by Onchi is taken from the book *Fresh Praise of Fuji* and shows an almost painterly use of the technique. There is no outline block and the areas of overlapped colour give the composition added depth. The use of white space within the print is exquisite.

© The British Museum.

The sheet is brushed onto the board using a soft brush, or for a glossy finish, a camellia leaf. Sun drying is the preferred and traditional method but for obvious climatic and economic reasons, heated steel sheets are frequently used. There are advantages and disadvantages to both methods and some experts can tell how a particular sheet has been dried, but for most purposes it is not a matter of any great importance.

At the drying stage, the front and back of the sheet are clearly decided. The side which was face down on the bamboo slats during the making process is brushed face down on the wood. When the paper is dry, it is smoother than the back where the fibres have been lifted slightly by the brushing. The difference between the front and back can be felt by rubbing the sheet gently between the fingers. For woodblock printing the paper is always used smooth side face down on the block.

After the sheets have been dried they are graded and prepared for sale. Some sheets are left as they are with a deckle edge (*mimitsuki*) on all four sides. Others are cut to various traditional Japanese sizes.

Japanese paper sizes

It is not easy to summarise Japanese paper sizes, as the sizes of traditional papers vary considerably from area to area, from type to type and from era to era. The most frequently found size for *Echizen hōsho* is called *Ōbōsho* and is 39.4 x 53cm (15 x 21in.). For traditional *ukiyo-e* prints this sheet was cut in half to give a print size of 26.5 x 39.4cm (10½ x 15in.) called *ōban*. This was halved again to give *chūban*. The most practical way to choose a paper is to work within the range available from your local supplier. As the paper is the most expensive part of the woodblock process, it may make sense to choose the paper first and work the print to fit the paper available. Cutting the wood to size will be cheaper than wasting part sheets of expensive *washi*.

Choosing paper

The process of identifying and buying *washi* suitable for woodblock is not easy. Because *washi* was often made by farmers in small villages in various parts of the country, similar paper can have different names and sizes and qualities also vary. For example a pure *kōzo* paper may not be easily recognisable as such because it is historically known by the name of the village that makes it rather than any generic term. A reputable paper merchant should, however, be able to identify the fibre used and in what percentage.

As a general rule, the cheaper papers have pulp added to keep the price down (they often have the name *hankusa* attached). These papers are perfectly adequate for most purposes. Because larger sheet sizes are possible, machine made papers are also popular although they do not usually have the deckle edge (*mimitsuki*) characteristic of hand-made

washi. To keep the deckle edge of the *washi* and print traditionally, the paper needs to be prepared (see diagram page 82). To produce a false deckle edge on *washi*, it should be dampened slightly along the line and then torn against a steel rule. The fibres will pull and give an imitation deckle edge.

A bewildering variety of Japanese papers is used in the printing process and for the final work. Each paper has a slightly different character and will be suitable for a certain type of print. Some are tougher than others, some have a shiny, less absorbent surface. It may be wise to experiment before purchasing large quantities for an edition.

Kizukihōsho

Hōsho is regarded as one of the finest Japanese papers and was traditionally used for ceremonial purposes and so it has considerable cultural importance. *Kizuki* means that it is made from pure fibre – in this case pure *kōzo*. It is ideal for printmaking as it is thick and strong enough for repeated printings but has a soft surface to take the colour. The surface can be quite fluffy. Several papers bear the *hōsho* name.

Echizen hōsho

Traditionally some of the best *hōsho* comes from the famous papermaking area of Echizen in Fukui prefecture north of Kyōto. The average size of a large *hōsho* sheet is approximately 39.4 x 53cm (15 x 21in.).

Masagami

This paper is a type of *hōsho* which nowadays is generally known by that name. It also used to be called *iyomasa* or *iyobōsho*. As it was relatively cheap, this paper was often used for *ukiyo-e* prints. It is whitish in colour, fairly soft and is primarily made in Ehime prefecture on Shikoku island.

Kikaibōsho

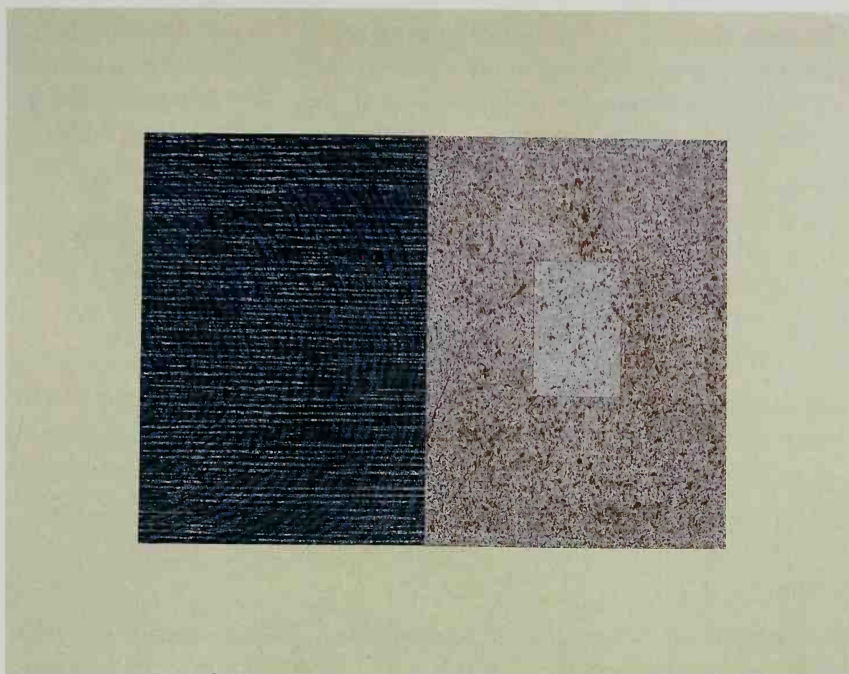
This is a machine-made version of *hōsho* which again is adequate for many purposes. It is less absorbent than hand-made *hōsho*.

Nishinouchi

This is a good quality thickish *kōzo* paper, often used for making books and ledgers. The colour of the paper is off-white. It was made mainly in Ibaraki and Tochigi prefectures, north of Tōkyō. The usual size is 30 x 46cm (12 x 18in.).

Hosokawa

This *kōzo* paper, although used for account books and records, was also used for woodblock prints, particularly single colour prints as it is slightly thinner than other papers. It was made in Saitama prefecture north of Tōkyō.



Four Arcs III, Rebecca Salter, UK. Edition 4, image 23 x 38cm, paper 33 x 49cm, 1995. Unsized thin *kōzo* paper from Korea is printed on the back (*urazuri*) and the front using a combination of blocks and a mixture of thick and thin colour. Registration is on squared paper rather than using *kentō*. The softness of the impression comes from the unsized paper and printing on the reverse. The print is cut to size and laminated onto a sheet of thick *kōzo* paper from Tosa, Shikoku.

Hodomura

This paper also belongs to the *kōzo* family but uses the finer fibres. Rice flour used to be added to the paper but not any longer. It is only made in one place in Tochigi prefecture.

Minogami

Thin *minogami* (*usumino*) made from pure *kōzo* was used for the original drawing (*hanshita*) which was then pasted onto the block. It is one of the earliest Japanese papers and is still made in Gifu prefecture near Kyōto.

Torinoko

This paper was originally made from *gampi* then became a mixture of *mitsumata* and *gampi*, but now includes *kōzo* as well. The Japanese name derives from its eggshell colour, although modern versions of this paper are often white. It has a very smooth surface and, as it is not as absorbent as other papers, it was not widely used for woodblock. The best *torinoko* was originally made in Fukui prefecture but it is also made in Gifu and Tosa prefectures.

Shintorinoko

This is a machine-made imitation of *torinoko* with the addition of pulp. It is available in larger sheets and is relatively cheap so is a popular choice particularly for practice prints.

Kyokushi

This is a thickish, internally sized, rather hard and non-absorbent paper made with *mitsumata*. It is not easy to use for Japanese style woodblock but is good for wood engraving. It was traditionally used for printing money and was a Japanese attempt to copy Western style paper in the Meiji period.

Zubiki

This is a *washi* tracing paper.

Gampi

This is a very thin, strong but expensive paper made from the *gampi* fibre. It can be used for the original drawing to be pasted onto the block, or as tracing paper.

Gasenshi

This is a very absorbent Chinese-style paper made from short fibres such as bamboo. Because it lacks body it is hard to register but can be used successfully for single colour prints. If used unsized, the impression will be very soft.

Western paper

The quest for a Western replacement for expensive *washi* continues but as the fundamental method of production – and thus character – of the two papers are so different, it is not easy. Western papers can be used for single colour prints which are then weighted and dried or stretched on a board. Trying to register a Western paper for a multicoloured print would be very difficult and frustrating as the paper would buckle on the first impression and subsequent registration would be hard.

Sizing

Japanese paper is naturally very absorbent and so takes water-based colours rather like ink on blotting paper. For single colour prints this quality can be used effectively, but for editioned multicoloured prints, the absorbency of the paper needs to be controlled. This is done by sizing the surface with a size (*dōsa*) made from a mixture of animal glue and alum. The glue strengthens the paper and the alum helps to control the absorbency. After the paper has been made, a batch will be sized to suit the requirements of the printmaker. Some artists prefer to size the paper themselves. A few papers are sold ready for use as size can be added during

manufacture. To check if the paper needs sizing, or how strong the size is, lick a corner of the sheet. If the saliva is absorbed immediately, the paper is unsized. If not, then the paper is well-sized. The contrasting absorbencies of sized and unsized paper can be used as a special effect. (See photograph below.)

Making size

A basic recipe for size is as follows:

25g (1oz) *nikawa*

13g (½oz) alum

0.6l (1 pint) water

Nikawa is a traditional animal glue used in Japan – it is stronger than gelatine.

A recipe using gelatine is as follows:

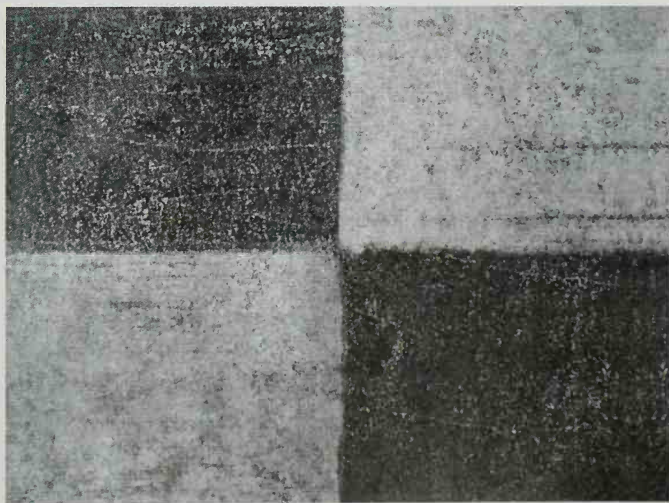
13g (½oz) (or 5 sheets of leaf) gelatine

1 teaspoon alum

0.6l (1 pint) water

Soften the *nikawa*/gelatine over a low heat in a little water. Boil the remaining water and add it, stirring well. Do not allow the mixture to boil. Add the alum and continue stirring until it becomes translucent. Remove from the heat and strain through muslin to get rid of any impurities. To make *nikawa* to mix with pigments or to print powder colours, do not add alum. Sizing should be done with the size at room temperature. The thickness of the size varies with the season; it should be slightly thicker in the summer months than in the winter months. Size does not keep and should be made fresh for each application.

Dōsa (size) printing. The white squares were brushed with size on both sides of the paper before the whole sheet was printed with *sumi* giving a contrast between sized/unsized areas.



Sizing a sheet

Lay the sheet of paper to be sized on a clean board. Traditionally a flat brush made from Chinese sheep's hair called a *dōsabake* is used, but a broad brush can be substituted. The size should be applied in even sweeping strokes (preferably with the grain of the paper). The sheet is hung up on a line to dry and then sized on the reverse. Two coats of thin size are better than one thick coat. The sizing on the front helps the pigment adhere evenly and, on the reverse, protects the surface of the paper from the rubbing of the *baren*. If the print involves numerous impressions, it may be necessary to re-strengthen the paper by re-sizing the back of the paper during printing. The print would have to be dried, re-sized on the reverse with weak size, dried and then moistened again to continue printing.

Size printing/brushing

Printing/brushing/stencilling a design with size onto the blank paper can give interesting results when overprinted. The pigment takes more easily in the unsized areas, giving a contrast with the sized design (see illustration page 47).

Preparing the paper for printing

Japanese paper has to be moistened before it can be used for woodblock printing. If the paper is used dry, the water absorbed from the pigment in the first impression will expand the fibres of the paper, it will wrinkle and subsequent printings will be out of register. The aim, therefore, in moistening the paper is to expand the sheet in all directions so that there is no further movement caused by the absorption of the colour. In addition, the pigment will adhere more evenly to dampened paper and it is easier for the pressure from the *baren* to force the transfer of colour from block to paper.

Wetting the sheets

It is hard to gauge the exact degree of dampness required at first, but the points to remember are that the paper should be evenly moistened, there should not be any 'puddles' of water on the surface and the paper should not be so wet that it becomes completely floppy and impossible to register. As the printed area is repeatedly moistened through the printing process it is also important to make sure that the surrounding margins that are not being printed do not dry out and cause buckling.

Traditionally alternate sheets were brushed with water and stacked in a pile under a weight until all the sheets were evenly damp. The sheets were then spread out on a board in one of two formations, *otosu* or *hawasui* (see diagram page 49) to ensure that the sheets were kept evenly moist during the printing process. Using this same brushing method, the paper can be coloured or tinted all over as a background before printing starts.

The following method using newsprint is just as effective and easier for the beginner to control the dampness of the sheets.

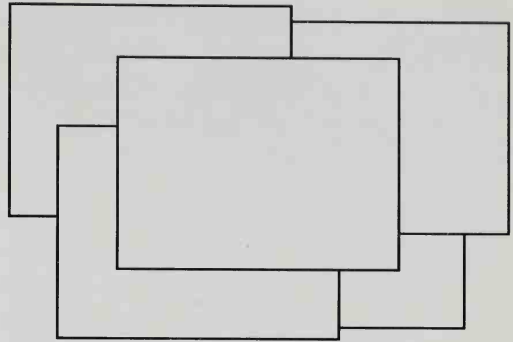
Water is brushed onto a pile of sheets of newsprint (or cardboard or blotters) using a *mizubake* (or broad brush). The pile is then left for about one hour for the water to dampen all the sheets evenly. A water spray can also be used instead of a brush. The paper for printing is then slotted between the dampened sheets and left to expand well in advance of printing. The top and bottom of the pile are most vulnerable to drying out, so allow four or five extra damp sheets of newsprint at both ends. The pile should be kept covered with plastic, especially if the workshop is hot and dry.

To keep the moisture content stable, the pile can be sprayed from time to time with a water spray. If the pile is to be kept damp for several days for a particularly complex print, there is a danger that the printing paper will start to go mouldy. To try and prevent this, a couple of drops of formalin (or Mildewcide) can be added to the water before brushing the newsprint. Formalin is not easily available and an alternative is now on the market in Japan. Being able to keep the prints damp for prolonged periods is an obvious advantage in the production of a large edition.

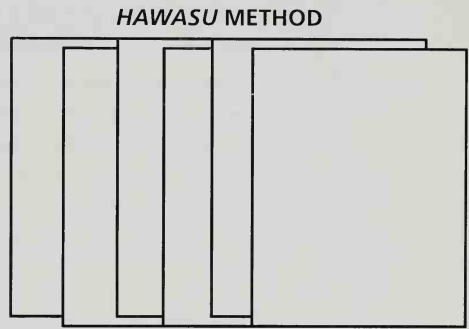
In a traditional workshop layout, the paper for printing is placed directly in front of the printer, and once printed it is placed in a pile to the left to be kept damp until the next colour is applied (see diagram page 84).

Baren

A top quality handmade *baren* is probably the most expensive piece of equipment used in Japanese woodblock, but it will last a life-time. Unlike a press, it takes up very little space and is easily transportable.



OTOSU METHOD



HAWASU METHOD

Otosu and *hawas* methods of arranging dampened paper.

The development of the *baren* in its current form in Japan was fundamental to the flowering of the technique of woodblock.

The *baren* originated in China, although its form changed and developed during its introduction to Korea and then to Japan. The Japanese *baren* shape appeared in the mid-Edo period and has remained almost unchanged since. There is no clear explanation for the origin of the Japanese name – *baren* – written with the characters for ‘horse’ and ‘company/group’. This may have come from the name of a Chinese plant, possibly ‘*barenso*’ or a kind of iris from Manchuria called ‘*maren*’. Maybe the *baren* was originally made using this iris. The Chinese style of *baren* was basically much simpler than the Japanese version. It was, and still is, a block of wood tied round with a bundle of plant fibres/leaves. A Korean *baren* is tied with horse hair. The *baren* in this early form was probably first introduced into Japan by the Chinese who crossed over to print Buddhist sutras in the Muromachi period (1334–1572).

The Japanese form has changed very little – it is approximately 14cm (5½in.) in diameter and is composed of three parts: backing (*ategawa*), core (*shin*) and bamboo cover (*kawa*). A top quality *ategawa* and *shin* will probably last a lifetime but the *kawa* will need to be replaced regularly. Each part of the construction plays its role in the efficient transfer of pressure from the shoulder of the printer evenly across the entire block. Traditionally the *baren* were made by the printers themselves in the evenings, but now they are either mass produced or hand-made by specialists.

Clockwise from top left: home-made *baren* using plastic cord *shin* wrapped in a handkerchief; student quality *baren*; artist quality *baren*; disc *baren*

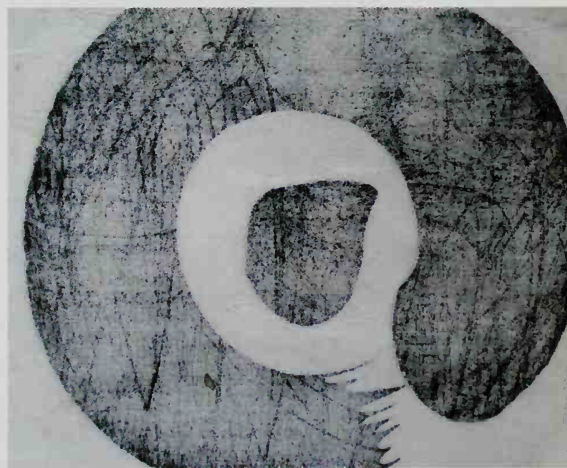


Ategawa

The backing (*ategawa*) of a proper hand-made *baren* looks deceptively simple, but tremendous time and care goes into its construction. It is formed from between 30 and 50 thin sheets of *minogami* which are laminated one by one onto a wooden 'former' over a period of months. Recycled paper from old ledgers or books is frequently used because it is generally of very good quality. The paper is cut into circles of varying sizes to build up the convex profile of the finished *ategawa* which helps the even spread of pressure during use. The first sheet is plain paper, but subsequent sheets are brushed with *kakishibu* (persimmon tannin, a natural waterproofer) and allowed to dry before being stuck on using a paste made from flour from the fiddlehead fern mixed with *kakishibu*. This glue is very strong but not bulky, as the finished *ategawa* is barely 3mm ($\frac{1}{8}$ in.) thick. When all the paper circles have been stuck down, a piece of thin silk gauze is applied and covered in lacquer. The lacquer finish is impermeable but flexible and the slow lamination process gives the *ategawa* great strength. The finished *ategawa* is then cut off the block forming a shallow rim on the underside to hold the *shin* in place. Cheaper *ategawa* are made from board or wood.



Ategawa at different stages of production. The circles of *washi* (front right) are layered over the wooden 'former' (left), covered with gauze and lacquer (top centre). The finished *ategawa* is cut from the 'former' using the tool (centre).



Baren marks showing on the back of a print.

Shin

The *shin* is without doubt the most important of the three parts of a *baren*. It is a coil of twisted fibre at least 3.6m (4 yards) and sometimes as much as 25m (27 yards) long, tacked into a spiral which fits neatly within the rim of the *ategawa*. The bumps on this spiral of cord are the points of contact with the back of the print and transfer the pressure from the printer's arm, via the *ategawa* to the print. Making the cord is extraordinarily time consuming and as a result a proper *shin* is very expensive. The best cord is made from the leaf of the white bamboo (*shiratake*) which is in increasingly short supply. The edges and the centre part of the leaf are not suitable; the remaining sections are cut into 20cm (8in.) strips. After being soaked in water for a couple of minutes, the sections of leaf are split to separate the inner and outer layers. The inner layer is discarded. Using needles set a fixed width apart (generally between 1 and 3mm), the outer layer of the leaf is split into fine strips which are then kept damp for twisting. These strips are twisted together to form the first stage cord called *niko* (2 strand). As the cord is twisted, new strips are added and the ends are tidied up later when it has dried. If the 2 strand cord does not stand up when held, it is considered too weak and of no use. This basic cord is then

doubled and re-twisted to form the next thickness, *yonko* (4 strand).

(See photographs opposite.) From this, the repertoire of available *shin* can be made as follows:

yonko (4 strand) doubled to form *yakko* (8 strand)

yakko (8 strand) doubled to form *jurokko* (16 strand)

juniko (12 strand) is made by twisting a 4 and 8 strand together, slotting the 4 strand into the ridges of the 8 strand.

This cord has a softer profile.

The overall variety of *shin*

available is considerable because the finished thickness will also depend on the width of the original strips cut from the leaf. One of the most labour intensive – a 25m (27 yards) 16 strand cord made from 0.6mm strips of leaf – can take at least two weeks just to twist.



Samples of different thicknesses and grades of *shin*.



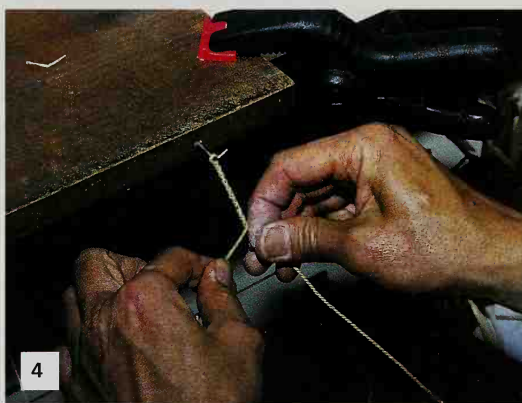
1 The lengths of bamboo leaf are split and the inner layer is discarded.



2 The outer layer is shredded into strips using needles set into wood.



3 The strips are twisted into *niko* cord. The ends are snipped off when the cord is dry.



4 A *niko* cord is twisted to form a *yonko* cord.

5 The finished *shin*, sewn into a spiral fitted inside the ridge and paper cord of the *ategawa*. The *kawa* has been removed.



When the cord is finished, it is stretched to remove any kinks, then sewn into a spiral using linen thread before being fitted into the *ategawa*. A single coil of paper string sits between the *shin* and the rim of the *ategawa*. Before the *baren* can be covered, the *baren*-maker ensures that the cord is lying flat and is even; if it is not blocks of colour will not print cleanly.

A proper hand-made *shin* will last well and if over time the small ridges which transfer the pressure start to flatten out the cord can be softened in water and then re-twisted. Cheaper *baren* use *shin* made from manufactured cord/string, which do not last as well.

Kawa

The *shin* and *ategawa* are wrapped together in a bamboo leaf from the species *madake*. It is this covering (*kawa*) which comes into direct contact with the print and, in order for it to slide smoothly over the paper, it needs to be kept oiled while printing. The printer keeps a small pad of cloth soaked in camellia oil (substitute with vegetable or olive oil) to hand for this purpose. There are also stories that the average printer's hair or face was greasy enough to serve as an alternative.

As the *baren* is used, the *kawa* will of course start to wear out. To delay this as long as possible, the printer turns the *shin* and *ategawa* in the leaf every now and again as he is printing. This stops the *shin* wearing holes in one particular area of the *kawa*. Alternatively, small stick-on plastic discs are now sold to protect the surface. Ultimately, however, it will need replacing.

Covering the *baren*

Wrapping the *baren* in a bamboo leaf can be tricky. The bamboo leaves used must be kept in a moist atmosphere or they will split. Before wrapping, the leaf should be dampened overnight to soften it naturally. Working on a smooth, sturdy surface the leaf should be flattened out by rubbing it diagonally with the heel of the hand which is lubricated with camellia oil (or vegetable oil). The strong ribs of the leaf then need to be crushed by rubbing over them on both sides with a pebble or the handle of a pair of scissors. If this is not done, the *kawa* will not lie flat when it has dried. One end of the leaf is cut to form the handle shape. The *shin* and *ategawa* are placed on the leaf, and held firmly with one hand, while the other hand pleats the leaf round the shape. This, needless to say, takes considerable practice. The pleats should be neat, turning in the edge as they go and meeting in the middle to form a natural handle. Holding everything firmly, the *kawa* is turned round, cut as before to a handle shape and the pleating repeated on the other side. The two handles are brought together tightly in the middle and tied with linen string. After an hour or two the leaf will be dry, the ends can be cut off the handles and the non-pleated edge cut to shape. The new *kawa* and the *baren* will be ready for use. (See photographs opposite and on page 56.)



1



2

1 Rubbing the damp leaf diagonally with the heel of the hand.

2 Crushing the ribs of the leaf with the handle of a pair of scissors.

3 Cutting the end of the leaf to a handle shape.

4 Holding firmly with the left hand, the leaf is pleated round the *ategawa*.



3



4



5 The other side is cut to a handle shape and pleated to match.

6 Pleating the second side.

7 The two handles are pulled together in the centre and tied with string.

8 When the *kawa* is dry, the handles are cut and the unpleated edge cut to shape.

Choosing a traditional *baren*

The expert printer will choose a particular *baren* for a particular purpose according to the thickness and strand number of the *shin*. There are also differences in the *baren* used for different styles of printing. Softer, Kyōto-style printing, where the pigment rests on the surface, uses a *baren* with a larger surface area. Tōkyō (or Edo-style) printing calls for a harder *baren* to force the colour right through the paper. In general, for heavy pressure, and when *baren* marks are required, a medium 16 strand would be used. A medium 8 strand is a fairly standard *baren* suitable for most purposes. A super-fine *baren* (twisted from 0.6mm strips, for example) would be used for very delicate work such as the hairline and faces. Several different *baren* may be used on the same print.

Alternative *baren*

It is clear that for many printmakers both in Japan and elsewhere, a *baren* which does not need covering would have advantages. A plastic alternative called the disc *baren* is now made in Japan, it works very well and of course avoids the running repairs necessary with a traditional *baren*. A *baren* made with tiny steel balls is also available and would be especially suitable for large-scale heavy printing.

Home made *baren*

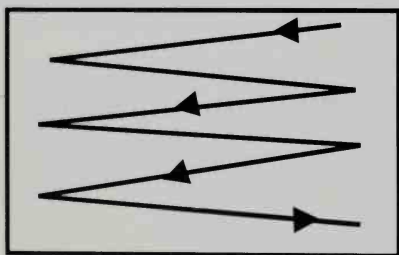
Although the back of a spoon or a pebble are often recommended, they really are poor substitutes. The success of the *baren* lies in the broad contact area which transfers the pressure evenly and smoothly thus forcing the pigment from the block into the paper and resulting in a flat area of colour. The spoon or pebble only gives a tiny point of contact with the block and makes it extremely hard to print even colour.

If you want to try and make an alternative, it is more likely to be successful if it copies the basic construction of the real *baren*. Instead of the *ategawa*, sheets of cardboard can be laminated or a disc cut from plywood or plastic. There are numerous alternatives to the *shin*. A similar spiral can be made from plastic twine/cord, electric wire, string or even chain (the small ball chain used for bath plugs perhaps). Woven fibre table mats can also be used. A substitute covering can be made from an old handkerchief, a sock or a pair of tights.

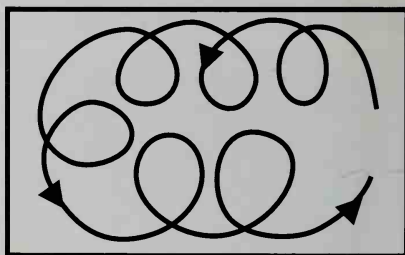
These alternative *baren* will all behave differently when used so it is worth experimenting before choosing the *baren* to print a particular edition. Some *baren* will be coarse and leave quite visible marks in the printed colour. If you need a very gentle *baren* to print a particularly tiny or fine line it might be worth trying a dry sponge or a sheet of rough grade sandpaper instead of the *shin*. When using these alternative *baren*, it is a wise precaution to use a sheet of tracing/greaseproof/waxed paper (*ategami*) on the back of the print when rubbing to prevent damage.

Using the *baren*

The *baren* is gripped by four fingers through the handle with the thumb over the end and pressure applied from the shoulder, down through the arm and wrist to the heel of the hand. Printers traditionally work sitting on the floor at a low table sloping away from them. It is not necessary to sit on the floor but the printing table height should be right before embarking on a large edition. The *baren* is moved swiftly across the carved area to fix the print, stroking into the *kagi kentō* and then moved in a zigzag or a circular formation. The former is called *kimekomibaren* and is slightly sharper and therefore better for flat areas of colour. The latter is called *mawashibaren* and encourages the colour right into the paper and so is suited to smaller areas and fine lines (see below). There are no fixed rules though, so it is best to experiment and see which suits the work, paper and pigment better. Whichever *baren* is chosen, it should always be used flat so that it bridges the printing areas and does not 'tip' into the cleared areas.



Kimekomibaren



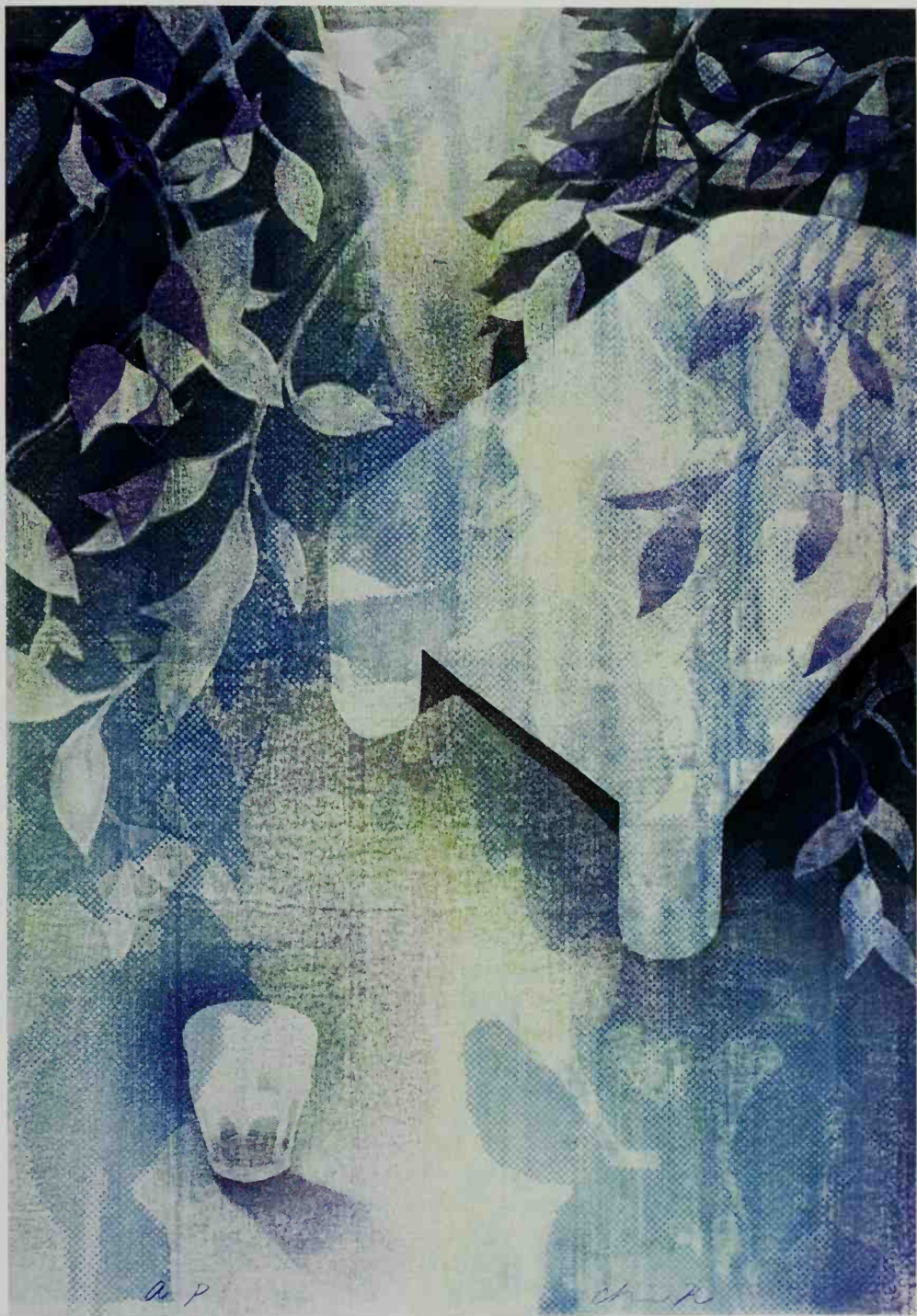
Mawashibaren

Care of the *baren*

Alternative *baren* will probably need little attention, but a traditional *baren* needs to be looked after. The surface should be kept oiled but allowed to breathe. Do not leave it lying face down or in direct sunlight or near sources of heat.

Opposite: *Empty line between frontiers*, Kawabata Chie, Japan.
Edition 2, 98 x 68cm, 1999.

This print uses six blocks and many colours on *torinoko* paper. Parts of the block are carved and parts are coated with varnish which repels the water when inked up in the traditional way with water-based colours. The consistency of the varnish is the key to this technique which produces interesting effects not possible with traditional cutting.



as p

chick

Chapter 3

METHOD

*Carvers, printers, print outline, original drawing, carving process,
kentō, printing process, making a single colour print,
making a multicolour print*



Carvers

Although very little is known about the lives of the carvers and printers who contributed so much to the flowering of *ukiyo-e* as an art form, there are hints as to their respective characters. Carvers were generally considered to be quiet and retiring, printers more outgoing and lively. The portability of the *baren* made it possible for printers to change workplaces relatively easily and as a result they rightly or wrongly developed a reputation for volatility. The apprenticeship of a carver would last at least ten years. He would start by carving very simple letters on scraps of leftover wood, would move on to carving the script for song books before graduating to the plain colour blocks for *nishiki-e*. He would still not be allowed to cut the single brush stroke outlines but could cut the patterns on textiles. In such spare time as he had, the apprentice would practice spacing these geometrical patterns with a compass and ruler because the artist rarely did more than give an indication of the textile pattern required on the original drawing. He was then allowed to undertake the clearing of large areas on the blocks before learning the art of cutting the figure.

His figure-carving career began with the hands and feet and, after mastering finger tips, he was allowed to cut the nose which had to be done in one pull and there was no chance of rectifying any mistakes. The ear and head including the outline of the face came next. This part of the composition called for considerable experience and judgement on the part of the carver. The aim at all times was to preserve the freshness of the brush-drawn line on the original drawing so if possible the carving was always done in the same direction as the brushstroke. The brush line, however, would be wider than the final printed line so it was up to the carver which side of the original line he followed and by how much he reduced the width. A true master carver was capable of carving a face line characteristic of each artist without reference to a drawing. As so few original drawings survive, it is hard to appreciate fully the extent of the carver's interpretation. To become a fully-fledged carver, however, the apprentice had to master the most difficult area of all, the hairline. This again would only be roughly indicated by the artist. The interpretation was

left up to the skill of the carver who had to be able to carve different types of hair, wet hair or dead hair for example. Although hair was generally considered the most technically challenging, *shunga* (Japanese erotic prints) are considered by some to be the true test of a master. The cutting of the figures not only had to be technically perfect but the emotion and excitement of the scene had to be expressed with just a few cuts of the knife.

There were two categories of carvers, the *kashirabori* (literally carvers of the head) and the *dōbori* (carvers of the body). The *kashirabori* were the most highly skilled and had overall responsibility for the blocks and would hand out work to the *dōbori* in line with their abilities. At every stage in its production the *nishiki-e* print was truly a team effort. In addition to *nishiki-e* carvers, there were also specialists in lettering.

Printers

As with his fellow craftsman, the carver, little is known about the lives of the printers responsible for transforming the cut blocks into finished works. There is no doubt, however, that their extraordinary technical ability and accuracy required a similarly arduous training. In order to produce the prints in such vast quantities and to such a high standard, the techniques of printing needed to become second nature to the experienced printer. The apprenticeship started with the menial workshop duties such as moistening the paper for printing, washing the cloths and brushes and providing supplies of clean water. Apprentices also learnt how to mix the pigments and cook the rice paste (*nori*) before starting learning to print by practicing on sheets of wrapping paper or working on cheap prints. They would then be allowed to print some colour blocks, but only those colours such as grey, yellow or pale blue which did not show any shortcomings in their technique. Dark colours were considered more difficult and only the experienced printers were permitted to print the all important keyblock.

A skilled printer could average 200–300 sheets per day for straight-forward printing, 20–30 if he was printing gradation (*bokashi*). The names of the carver and printer were rarely recorded on the finished print which usually credited just the publisher and artist. Outside the *ukiyo-e* system, there were printers who specialised in black and white prints without *kentō* registration. They were looked down upon by the more skilled *nishiki-e* printers.

Print outline

In the following sections I will show the process in a series of three simple prints based on a sketch of London roofs. I scanned the sketch, reduced the size and used that as a base for each print.



Original *sumi* sketch of London roofs.

Single colour print

PRINT A

I worked on a copy in black ink, re-scanned it and printed it out on tracing paper ready to be transferred to the block (see page 89).



Left: original



Left: print

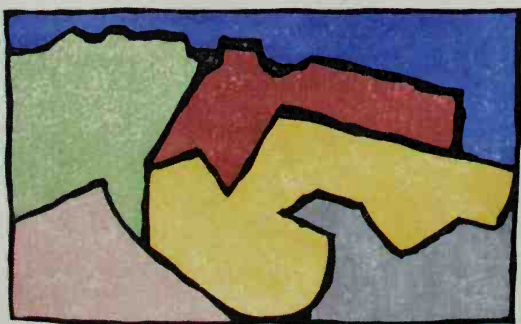
Colour prints

PRINT B: outline method

I worked on a copy in coloured pencils and black ink. A strong black outline was traced from that for the keyblock. The colour blocks were taken from the keyblock. It is a six colour print (on four blocks) plus a black keyblock (see page 91).



Top: original



Right: print

PRINT C: jigsaw method

I worked on a copy in watercolour, and took a tracing which was used to produce each colour block. It is a five colour print (on four blocks) plus one embossed block (see page 94).



Right: original



Right: print

Original drawing

Traditionally, the process of producing a print began with a publisher commissioning an original drawing called a *hanshita*. These drawings were produced by an artist using a brush and *sumi* on thin Japanese paper. Sized *minogami* was considered the best. The degree of detail in the drawing varied: there was very often only a rough indication of patterns on textiles or a stroke of ink to denote the hairline. The closer the working relationship between the artist and carver, the more was left up to the latter's interpretation. This stage in the printmaking process was fundamentally different to the tradition of European engraving where the artist/engraver worked directly on the plate. The challenge for the Japanese carver/printer was to bring the drawing on paper to life in another medium, wood. In this transformation they succeeded spectacularly.

Although traditionally the original was on paper and transferred, there is no reason why you should not draw directly on the wood, bearing in mind that the print will be reversed.

Transferring the drawing to the block

Traditional method

The method used to transfer the *hanshita* to the block explains why so few of these original drawings remain. Traditionally, the *hanshita* was reversed and pasted onto the block with *nori*, and the carver cut through it to produce a keyblock (*sumiban* or *kotsuita*). Sticking the drawing onto the block required great skill as the paper was very thin, so this process was usually the job of the head carver. Any mistake at this stage would result in the destruction of the drawing.

When using this method the block should first be checked for knots as they are difficult to carve and then rice paste (the thickness of cold cream) spread evenly on the surface of the block. This is patted lightly with the palm of the hand to leave a stippled texture which prevents the drawing sticking fast immediately. The drawing is reversed, held between the forefinger and middle finger of both hands, and placed face down on the block as lightly as possible. It can also be taped to the block along one edge, flicked back to apply the paste and then lowered gently. Working out from the centre, the paper is rubbed down using the flat of the hand or a *baren*, removing wrinkles and trapped air. The block is then left to dry naturally in the shade. Any attempt to carve while the paper is still damp will result in distorted lines.

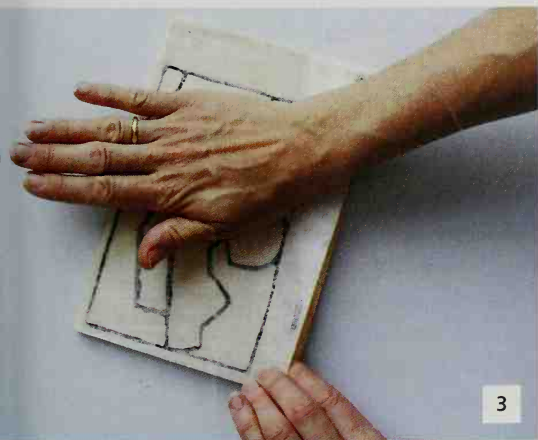
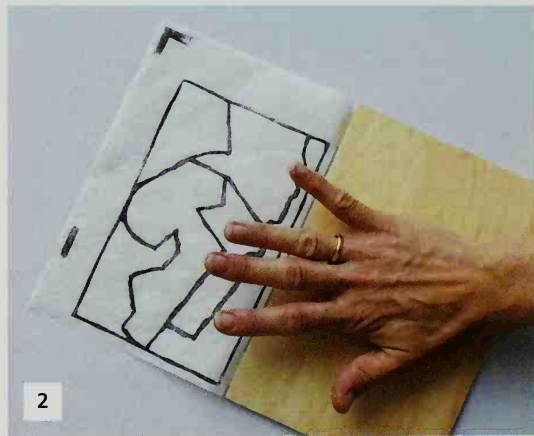
As the drawing is pasted face down, the *sumi* line may not be visible enough to carve. In order to bring out the lines, the block should be rubbed with a cloth soaked in camellia oil (vegetable oil). If the paper used for the *hanshita* was thick, oil alone will not reveal the line. It should be

dampened with a little water and then rubbed with the fingers to knead the surface fibres into clumps to reveal the line below. The block is then dried before being rubbed with oil and carved. *Kentō* should be marked and cut on the block in the correct place (see page 77).

When the carving is complete, the leftover paper and *nori* should be washed off the carved areas before a trial proof is printed.

Alternative methods

The traditional method of transferring a drawing is technically daunting even for the most skilled of printmakers. Fortunately there are simpler alternatives. Before tracing the image, the block can be brushed with pale watercolour and allowed to dry. When the cuts are made, they will then show as a clear line against a coloured background.



1 The drawing/keyblock print is taped to the block, flicked back and *nori* applied.

2 The *nori* is patted with the palm to produce a stippled texture.

3 The paper is flicked back and rubbed down with the hand/*baren*.



The block was washed with pale watercolour before the drawing was traced using carbon paper.

Carbon paper tracing

The original drawing is completed and the *kentō* are marked (see Positioning the *kentō*, page 78). Both drawing and *kentō* are then transferred to a sheet of tracing paper. This can be done by hand or the image (*kentō* included) can be scanned into a computer and printed out on tracing paper. The size can also be altered. The tracing is **reversed**, and pinned securely to the block using drawing pins (pinned outside the margin) with a sheet of carbon paper face down in between. The outline and *kentō* are then traced onto the block with a pencil. Pressing too hard may dent the wood. Accuracy in copying the *kentō* is, of course, vital to the success of the registration.

Laser print

The drawing (with *kentō* marked) can be scanned and printed as a laser print. The print is **reversed** onto the block and the line transferred using the tip of a hot iron because laser print ink is heat sensitive. Some photocopy inks will also work in the same way.

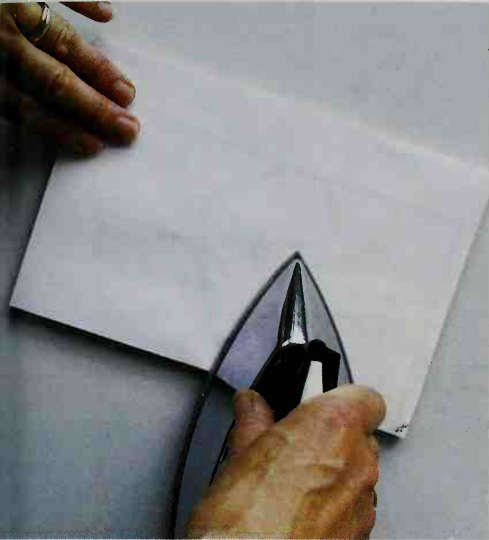


Charcoal/conté

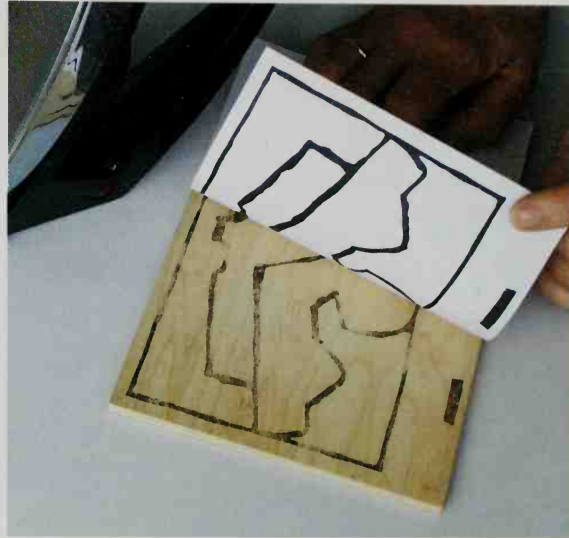
If the original drawing is in charcoal or conté on paper, this can be **reversed** onto the block and rubbed with a *baren*. If the transferred line is pale, re-draw it clearly before carving.

Whichever method is used, to make sure the tracing is always reversed, write a word on the front – if the word is backwards then so is the tracing!

Left: a Japanese block rubbed with camellia oil to reveal the line.



The laser print is transferred to the block using a hot iron.



The transferred laser copy.

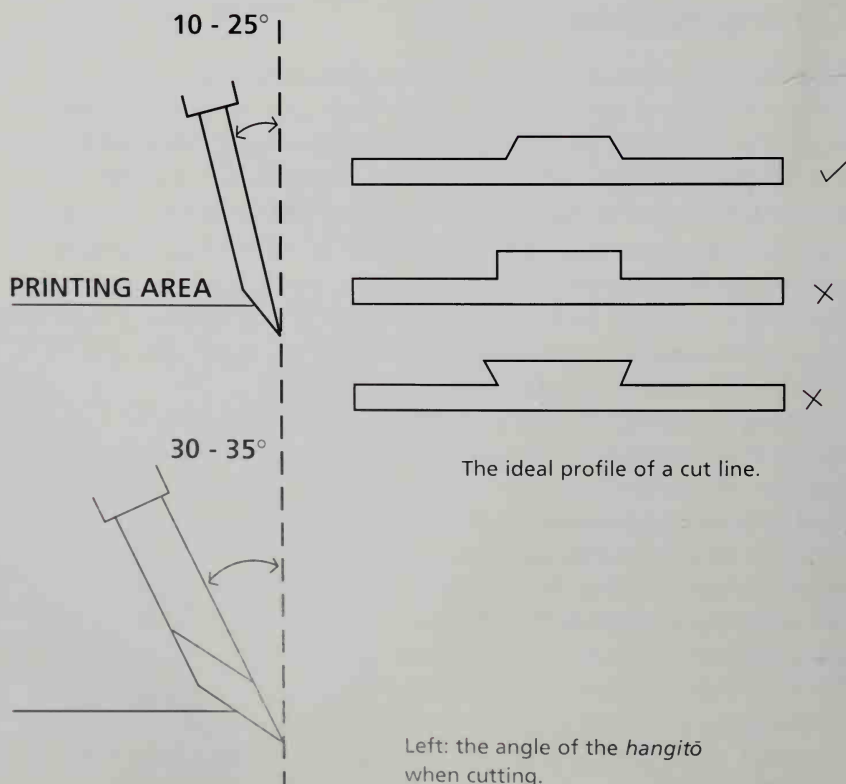
Carving process

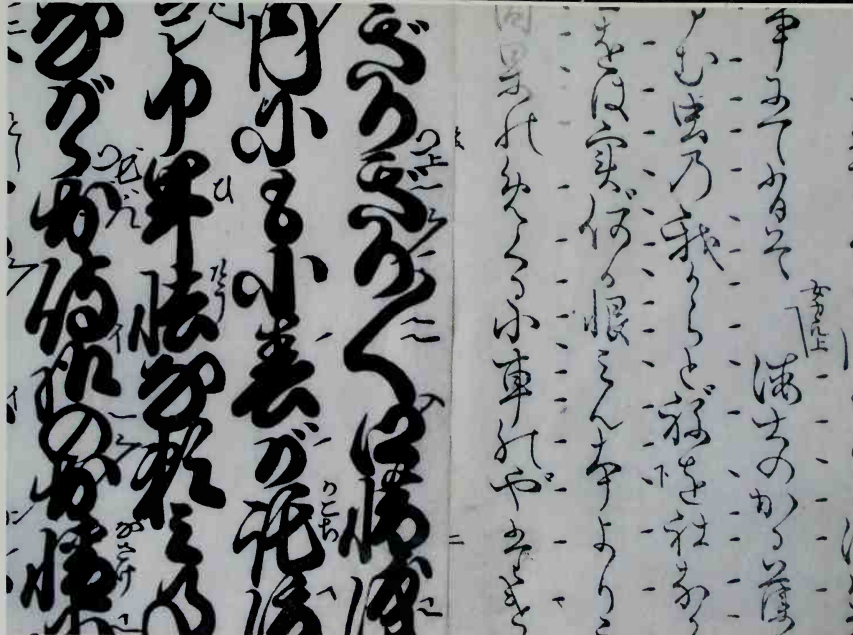
Traditional Japanese carvers work at a low table sloping gently towards them at an angle of 10–20°; the work is lit from in front if possible. The angle of the table and the lighting make it easier to see the line clearly as it is cut. Before starting to carve, it is important to make sure that the block will not slip around on the table. A bench hook can be used with the tools which cut away from you, but it will not hold the block while cutting the line because the *hangitō* is drawn towards you. Wet newspaper or a sheet of foam carpet underlay under the block will also hold it. Whichever method is used, it is important to ensure that the reverse side is not damaged or scratched, as the block will be carved on both sides.

Once the drawing has been transferred to the block, it is ready to be carved. Before starting on the actual block, it would be wise to become familiar with the tools and the various methods of cutting on a spare block. The carving process can be divided into two parts – cutting and clearing – of which the former is the more important. The quality of the initial cut line will bring the print alive. The outline of the design is cut first using the *hangitō* and then in the second stage the unwanted sections are cleared away to form a 'moat' around the printing area for inking up. The most important point to remember at all times is the profile of the wood left behind for printing. The printing surface must never be undercut or else it will collapse under the pressure of the *baren*. The ideal profile is rather like Table Mountain; the printing area will then be strong and the



A Japanese carver working at a traditional low table.





Two types of carved script – stages in a carver's apprenticeship.

Stages in the cutting/clearing process.

Top to bottom:

Stages 1 and 2 Cutting the outline in 2 cuts of the *hangitō*.

Stage 3 Clearing away from the cut line using the *komasuki*.

Stage 3 (alternative) Clearing away from the line leaving a buffer zone to be removed later.

Stage 4 Smoothing the ridges and the edge of the 'moat' using the *aisukilsōainomi*.



PRINTING AREA



PRINTING AREA



BUFFER
ZONE

PRINTING AREA



← CLEARED MOAT → PRINTING AREA



Left: a close-up of the keyblock (recent re-cut) of Utamaro's *A Woman Reading in a Mosquito Net*. (Courtesy of Kaneido, Kyōto)



brush will run smoothly over the surface and there will be no undercuts to trap excess pigment (see diagram page 68). Above all else, always be aware of the position of your hands. The tools are very sharp and one slip can result in injury.

Cutting

Stage 1

The aim of cutting is to make a V-shaped trench around the area to be printed. The initial cut is made with the *hangitō* which should be held firmly like a dagger, the thumb over the top to regulate the pressure and the middle finger or thumb of the left hand steadying the blade if necessary. If the knife has a long handle, hold it like a pencil. The *hangitō* is held almost upright with just the tip in the wood, and the bevel side facing the area to be retained for printing (see diagram page 68).

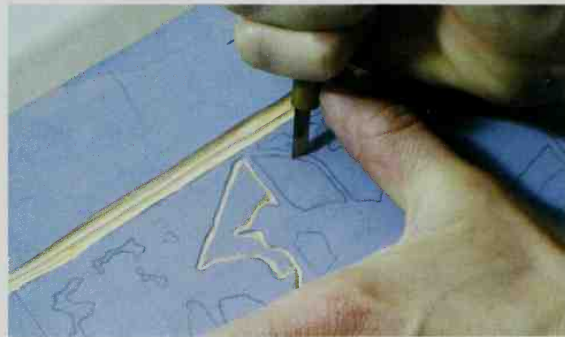
The cutting depth should be even at approximately 1–2mm ($\frac{1}{16}$ in.). Unlike all the other tools, the *hangitō* is pulled towards the carver. The tool is held firmly and moved slowly through the wood. Although the line in Japanese prints appears fluid, that ease of line is not achieved through speed but slow skill and control. The *hangitō* will naturally follow the grain if not controlled and obviously cuts faster through softer

Opposite: page from Hokusai's *Manga volume 6 (Military Arts)* showing the delicacy of a line cut with a *hangitō*.

Carving the block for Print A



Stage 1 Holding the *hangitō* like a dagger to pull the first line.



Stage 1 Guiding the *hangitō* with the left thumb while cutting the first line.



Stage 2 Holding the *hangitō* like a pencil to cut the second line.



A Japanese carver cutting a keyblock using the *hangitō*. The angle of his wrist changes as he carves.

areas. Poor quality plywood is particularly hard to carve finely, especially with curved lines, as it chips so easily. It is important to try and match the nature and quality of the wood with the design to be carved.

Stage 2

When the first line has been cut round the shape, the next line has to be carved to complete the V-shaped profile. A traditionally trained carver tends not to move the block, instead changing the angle of the *hangitō* with his wrist. However, most carvers now turn the block round and using the *hangitō* cut another line to meet the first one leaving a V-shaped furrow round the printing area. For this cut, the *hangitō* is held like a pencil at a shallow angle, and drawn towards you cutting with just the tip. If the angle is correct, the sliver of wood pops out with this second incision leaving a trench. These two cuts give a sharp outline to the shape to be printed and the next

stage is to clear away from the line taking care not to damage it. It is important to work systematically across the design, finishing one area before moving on to the next.

To cut a very thin line it is better to cut a thick line first and pare it down to size.

Clearing (*sarae*)

There are two approaches to clearing the unwanted areas which starts when all the lines have been cut. In the Edo period, the larger areas were cleared first before the delicate cutting of the printing areas began. The blocks were cut fairly deep. In the Meiji period, the order changed to the method most commonly used now, which involves cutting the lines first and then clearing out from there. The aim is to clear a 'moat' round the printing area to allow enough space for the colour to be brushed on. A 5cm (2in.) 'moat' should be adequate. Traditionally it was said to be the

width of three fingers (*yubisambon*). If there are large areas to be cleared between parts of the design it is important to bear in mind the need to support the paper across the whole block during printing. Strategic islands of uncut wood should be left. If too much is taken away, the paper will dip into the inked up 'moat' and pick up unwanted colour. The part of the 'moat' furthest from the printing area needs to be cleared slightly deeper so that if the paper sags a little during printing it should not pick up colour.



Repository of Forgotten Sensations, Wayne Crothers, Australia.

Installation at Setagaya Art Museum, Tokyo, each 180 x 90cm, 1995.

The figures used in these unique state prints are taken in ink from the artist's body. The image is transferred to plywood, carved, brushed with colour and printed. In some of the prints the form is clearly human, in others it appears to be faded like a long forgotten memory.



Stage 3 The cut line is cleared using the *komasuki*, steadied with the left hand.



Stage 3 The cleared line showing clearly against the block washed with pale watercolour.

Clearing the line

Stage 3 (see diagram page 69)

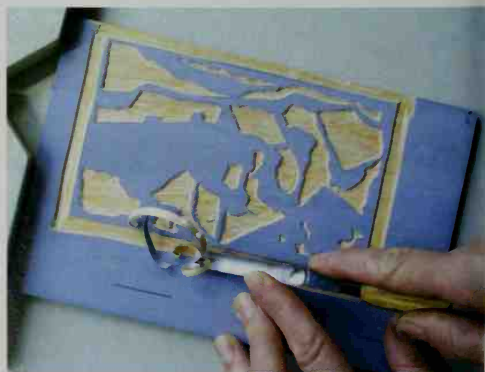
Using the *komasuki*, clear a line round the shape following the V-shaped furrow. Alternatively this trench can be cut a little way from the line giving a buffer zone in case of mishaps during clearing. Using a combination of gouges, continue clearing away from that line to the width of the 'moat'. The further away from the precious printing area, the safer it is to swap to larger tools such as the chisels. It is obviously easier to clear with the grain, rather than against it. Sometimes when clearing plywood, sections of an entire layer can lift. This makes clearing quick and easy but care needs to be taken to make sure the printing area is not accidentally damaged.

Stage 4

When the clearing round an area is complete, if a ridge was kept as a buffer zone it can be cleared using the *aisuki*. Also the ridges left by the round gouges in the cleared area should be flattened using the *aisuki* or *sōainomi* for larger areas. The cut outside edge of the 'moat' should be



Stage 3 The outline cut across the whole block with the *hangitō* and early stages of clearing with the *komasuki*.



Stage 3 Clearing with the *marunomi*.

chamfered gently with the *aisuki/sōainomi* and can be sanded with fine paper. Islands of wood left to support the paper should be treated in the same way. If the *aisuki/sōainomi* is not used to soften the block there is a danger that the sharp edges left by the carving will leave marks due to the rubbing of the *baren*.

In Western-style woodblock these clearing marks are often kept, inked up and printed as a part of the composition (in Emil Nolde's prints for example) but in traditional Japanese printing, they are always cleared and do not appear in a final print. There is no reason, however, why the ridges should not be left rough and printed if the paper happens to touch them if that suits the quality of the work (see page 97). When carving is finished, the block should be brushed with an old toothbrush to clean the lines.



Stage 4 Finishing with the *aisuki*.



Stage 4 Finishing with the *sōainomi*.



Final brush with an old toothbrush.



Right: cutting texture with the *sankakutō*.

Kentō are usually the last areas to be carved in a block (see page 78).

The above four stages cover the basic techniques needed to carve a keyblock and the colour blocks which make up a multicoloured print. Tools such as the *komasuki* and *sankakutō* can also be used to carve patterns or lines in their own right. The character of such lines is different from that of lines cut in the traditional manner using the *hangitō* and it is worth experimenting with them. A Dremmel or engraving tool, nails and saws can all be used to make marks on the wood (see illustration page 114). There are also other traditional cutting techniques which will be addressed separately (see Carving effects).

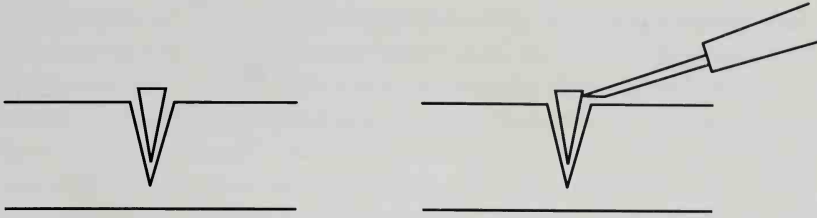
Repairing a block

It is inevitable that on occasion a tool will slip and a vital part of a line will disappear. All is not lost. It is possible to inlay a new piece of wood and recut the damaged section. Tiny nicks can be filled with plastic wood (left to dry and scraped back) but if a section of line is missing a small wedge of wood can be inserted. The edges of the damaged line should be cut with the *aisuki* at a slight angle and a wedge-shaped chip of wood inserted. This should be cut or sawn as close to the surface as possible and then shaved to match the surrounding line (see diagram page 77). For larger mistakes, the whole damaged area should be replaced. Using the *kentōnomi* (or any flat-bladed chisel) cut out a straight-sided rectangle around the damage to a level depth of about 3mm ($\frac{1}{8}$ in.). Cut off a piece of wood to roughly the same dimensions as the rectangle but twice the depth. If possible use a piece with similar grain and character. Using a wooden mallet (or wooden

handle) tap it gently into the hole: if it is cut carefully no glue should be needed. Using a small plane or the *kentōnomi*, shave the surface back until it is level with the old block. The damaged line can then be re-cut in the inlay. Repairs can only be carried out on completely dry blocks; when the blocks are subsequently dampened for use the plugs of wood should expand and stay firmly in place.



The carved block with *kentō* ready to proof.



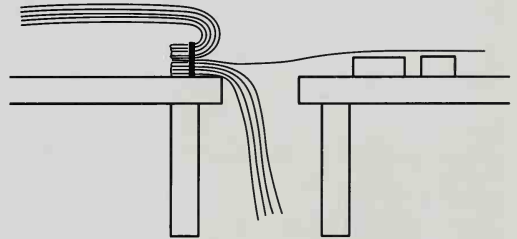
Above: a V-shaped trench is cut in the damaged area and a sliver of wood inserted.
 Above right: the inset piece is shaved to match the surrounding line.

In traditional *ukiyo-e* prints, this method was also used to inlay blocks of extra-hard boxwood in certain areas, such as the hairline, which called for very fine carving.

Kentō/Registration marks

The simple registration system of two shallow carved marks on the block called *kentō* was devised in Japan. It enabled the *ukiyo-e* artists to produce ambitious multicoloured prints. The skillful control of the materials and the extraordinary accuracy of the registration system allowed the art form to flourish. A complex print required numerous impressions and not the slightest movement in registration. There are disputes as to the origin of *kentō*, but it seems likely that the *kentō* method of registration was employed widely from the mid-18th century in Japan.

The Japanese *kentō* are completely unlike the system used in China, which probably originally crossed to Japan. In China, a pile of paper ready for printing was clamped to one table, flipped back and the blocks secured on a table next to it. When the blocks had been inked, a sheet was flipped over, printed and then dropped down the gap between the two tables. After the whole pile had been printed, the printer would start again with another colour block (see above). This was an adequate system of registration but using this method it would be impossible to print complex *ukiyo-e* prints with great accuracy. It can, however, be adapted for use with large prints or monoprints where *kentō* are unnecessary.

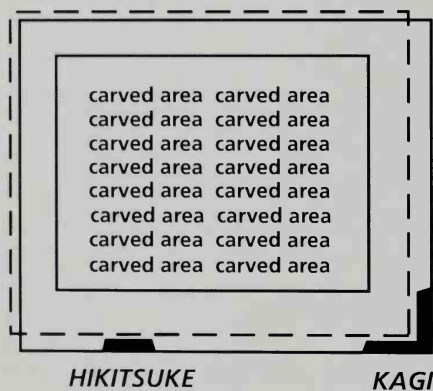


Chinese style registration

The pile of paper is clamped to one table, the blocks inked up and positioned on the other. The paper is flipped over, printed and slotted down between the tables.

The genius of the *kentō* system of registration lies in its very simplicity. The position of the *kentō* is fixed in relation to the image on the original drawing/keyblock and faithfully transferred to each block. The principle maintains exactly the size of the margin around the printed area on each block thus guaranteeing accurate registration.

There are only two *kentō* per block and they are always on the long side: in the bottom right-hand corner the *kagi* (key) and about two-thirds along to the left the *hikitsuke* (draw stop) (see below). The two *kentō* are carved on each block just deep enough to allow the edge of the paper to rest while printing. If they are cut too deep the paper will 'fall' into the *kentō* and the registration will be out. The *kentō* should be in proportion to the size of print, between 1.5–3cm ($\frac{3}{4}$ –1 $\frac{1}{2}$ in.) long.



— — — OUTLINE OF PAPER

The position of the *kentō* is fixed in relation to the printed area. The *kagi* *kentō* is in the bottom right hand corner, the *hikitsuke* *kentō* is two-thirds of the way along the long edge.

out of register. The most important point to remember is that the *kagi* *kentō* on the block is to the right so it must be marked on the left of the original drawing because it will be reversed at the tracing stage (lefthanders should do the opposite).

Cutting the *kentō*

The *kentō* are normally cut using a special chisel called the *kentōnomi*. It has a completely straight and fairly wide blade and a short handle. If you are unable to find a *kentōnomi*, an ordinary straight woodworking chisel will suffice.

Positioning the *kentō*

The decision on the position of the *kentō* has to be made right at the very beginning of the print process. Where the *kentō* are placed in relation to the printing area effectively fixes the size of the margin around the finished print. The paper size will also play a part in this decision.

Mark the position of the *kentō* on the original drawing using a set square and ruler. These marks should be transferred to the tracing and onto each block to be carved. Obviously this needs to be done very accurately to ensure good registration, although it is possible to alter the *kentō* after the test print if a particular block is

The chisel is placed on the traced line, flat side of the blade facing away from the printing area and towards the *kentō* to be cut. The handle of the chisel is tapped firmly with the hand, just enough to make a cut about 2mm ($\frac{1}{8}$ in.) deep. All three initial cuts should be made in the same way before clearing with the *kentōnomi* or *aisuki*.

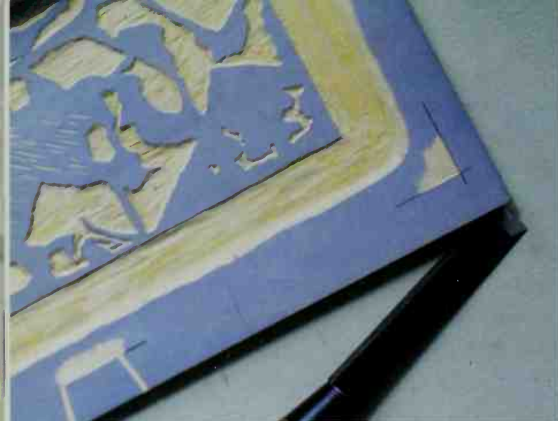
Carefully shave a shallow impression up to the line: it needs to be two or three times the thickness of the paper. The *kentō* should be completely flat except for a slight dip into the corner of the *kagi*. When you have cut both *kentō*, test them with a sheet of paper. It should rest comfortably in the *kagi* and against the *hikitsuke*. The *kentō* are normally the last things to be cut on a block.

If time and care are taken in marking and carving the *kentō* the system works well; it is one of the simplest methods of registration devised and

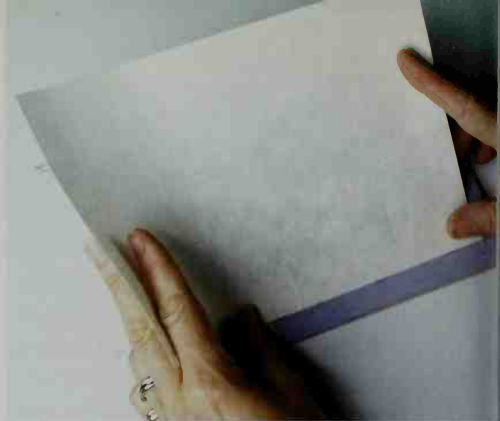
The first cut is made with the flat side of the *kentōnomi* facing away from the picture area towards the *kentō*. The *kentōnomi* is held upright and hit with the hand.

Using the *kentōnomi* (bevel side down), shave carefully up to the cut line.





The cut *kentō*.



Test the *kentō* with a sheet of paper.

is fundamental to the production of rich multicoloured prints. Strictly speaking *kentō* are not required for single colour prints but it is worth including them anyway. They make it far easier to place the paper squarely on the block and to print the colour twice if the first impression is a little pale.

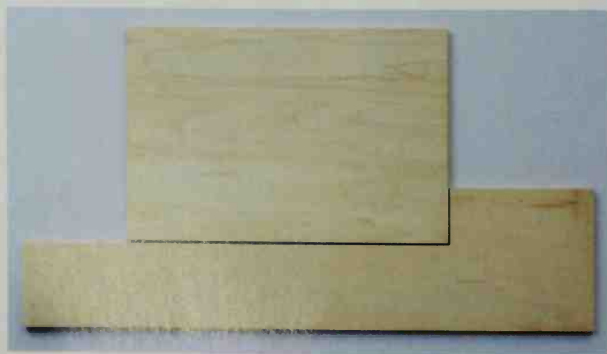
Alternatives to *kentō*

Kentōban

If the image area fills the whole block, an L-shaped *kentōban* can be used instead (see photograph). The *kentō* are cut on the *kentōban* and each block rests in the L-shape for printing. To ensure accuracy, the tracing of the blocks would need to be calculated in relation to the *kentō* on the *kentōban*. The *kentōban* can be used for several different prints if the position of the *kentō* are the same on each one.

Table method

The position of the blocks and paper can be registered on a large piece of squared paper on a table. Each sheet can be lightly taped in position, flicked back while the block is inked and positioned and then placed over the block for printing. This is similar to the Chinese method and would suit small editions or monoprints.



A block resting in the L-shaped *kentōban* marked with *kentō*.

Altering *kentō*

When all the blocks have been carved and a trial proof has been printed it will be obvious if one block is out of register. If the print has a black keyblock, the outline may be sufficient to hide the problem. If, however, the print has areas of colour adjoining each other directly (Jigsaw method, page 94), there is no alternative but to alter the *kentō* to bring the stray block back into register.

Correction is by either moving the *kentō* toward the picture area (*dasu*) or away from the picture area (*hiku*). It is obviously easier to rectify the fault by *hiku* as this just involves re-cutting the *kentō* with the chisel as before (see diagram page 82).

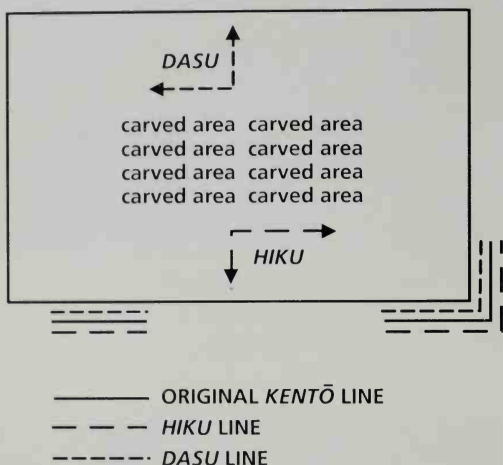


Above left: cutting a trench in front of the *kentō* with the *kentōnomi*.

Above: shaving a sliver of wood to insert in the cut trench.



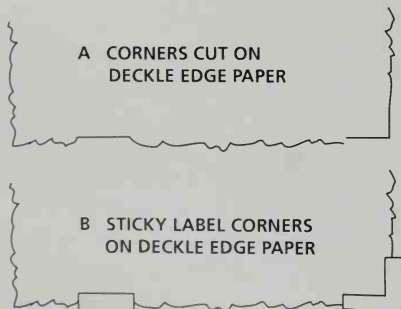
Left: detail of a block with altered *kentō*.



Altering the kentō to restore registration

Dasu – brings the *kentō* towards the picture area (away from the printer).

Hiku – pulls the *kentō* away from the picture area (towards the printer).



To register deckle edge paper

Top: cut straight edges in the deckle in line with the *kentō*.

Bottom: stick on straight edges/labels in line with the *kentō*.

be taped on the back of the sheet, or the deckle edge can be sandwiched between sticky labels (address labels for example). The paper/label should protrude beyond the edge of the sheet so that they can be slotted into the *kentō*. Removing them afterwards does not seem to damage the paper and leaves the deckle edge completely intact. In both cases the paper/labels should be positioned to align with the *kentō* on the block (see diagram above).

Dasu is rather more complicated and needs patience and a little skill. A shallow trench is cut in front of the offending *kentō* with the chisel as before and a sliver of wood is shaped and inserted. This can just be a shaving from the carving (see photographs page 81). The sliver of wood then needs to be tidied up and adjusted to bring the registration back in line. This may involve a few trial prints and some careful shaving with the *aisuki*.

Experienced printers become expert at making swift and minor adjustments to the blocks as they print the edition.

Preparing the paper to fit the *kentō*

Paper which has at least two straight cut edges needs no further preparation: it will slot directly into the *kentō*. If, however, the paper has a deckle edge, there will be no straight edges to rest in the *kentō*. There are two possible ways of solving the problem. Either cut a corner and a straight edge on each sheet with a knife (aligning them with the position of the *kentō* on the block) or attach straight edges to the sheet. These must not move even when the paper is damp for printing. Cut strips of paper can

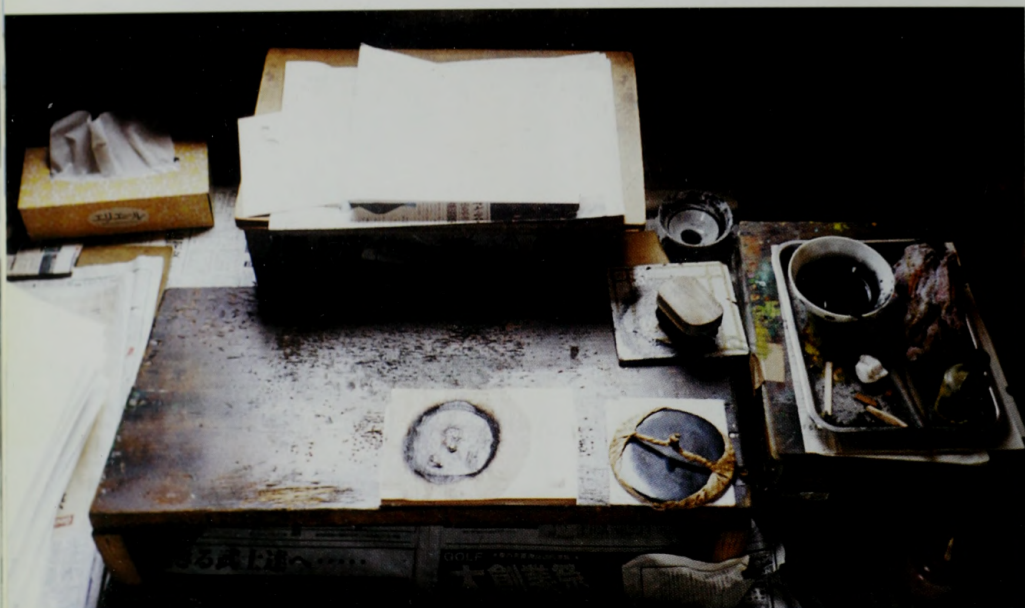


O-Hisa of the Takashima tea-house holding a fan, Kitagawa Utamaro, Japan. Woodblock printed both sides, 325 x 147mm, c1792.

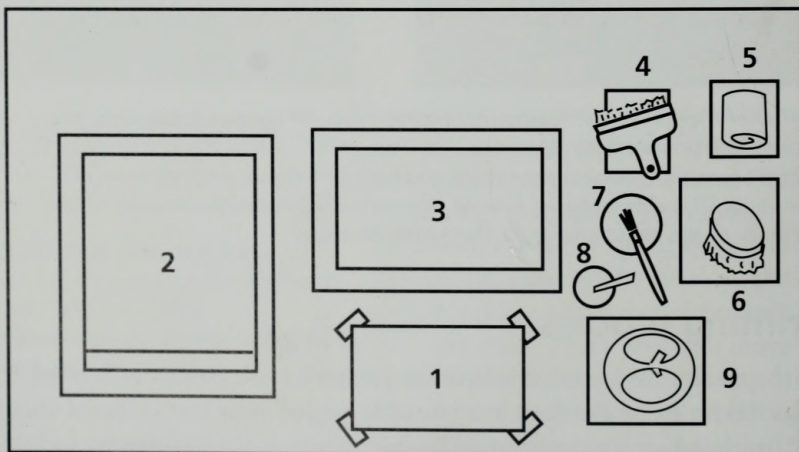
This is a rare print showing the front and back of a figure on both sides of one sheet. This extraordinary feat of registration was possible because of the accuracy of the *kentō* system. © The British Museum.

Printing process

In the traditional layout of a Japanese printer's work area (see diagram page 84) he sat on the floor at a low table angled away from him (at about 10°) with light from the front if possible. The printing layout can be altered to suit the individual, but it is advisable to have everything to hand. The paper has to be moistened (see page 48) and the printing area needs to be well-organised so that the edition can be printed efficiently. Normal workshop safety procedures should be observed.



A traditional printer's table in front of a window for good light.



The layout of a printer's table:

- 1 Woodblock resting on 4 pieces of folded cloth (*tomegire*)
- 2 Pile of printed prints being kept damp
- 3 Pile of prints for printing being kept damp
- 4 *Mizubake* (water brush) and water
- 5 *Zōkin* (folded cloth)
- 6 *Marubake* resting on a tile with colour
- 7 Pigment and *hakobi*
- 8 *Nori* and stick
- 9 *Baren* resting on an oiled pad

All the impressions are taken from one block before moving on to the next. There are four stages to printing:

- 1 applying colour and *nori*
- 2 placing the paper
- 3 rubbing with the *baren*
- 4 lifting the print

Applying colour and *nori*

The block to be printed is traditionally placed on the table with a piece of wet rag (*tomegire*) folded under each corner. These rags hold the block firmly but avoid damaging the carving on the reverse. The areas to be printed should be sponged or brushed with water which should be allowed to soak in. It will take a little time for the water to disappear with a new block. The surface should not be visibly wet. If the block begins to bow, brush the reverse with water. The *hake* should also be slightly damp, but not wet.

A small amount of *nori* should be dabbed on the block with a stick (*nori* is not needed on line blocks) then using the *hakobi*, pigment should be dotted around the printing area. It is important **not** to use the *hake* to transfer pigment as it will become saturated and it will be hard to gauge the amount of colour on the block. After a few impressions the colour will build up in the block and it will not need to be completely re-charged with each printing. Instead, the brush can be placed on a tile or glass sheet covered with just enough colour to keep it charged. If the colour is very pale, it can be mixed with the *nori* on the tile and the brush charged from there.



Dabbing a little *nori* onto the block with a stick.



Applying *sumi* with a paintbrush (or *hakobi*).



Mixing the *sumi* and *nori* on the block in a circular motion, holding the *hake* upright.

tends to remove too much colour and leave brushstrokes. Any spots of colour splashed outside the 'moat' should be removed with a cloth as they will print.

The first impressions on a new block will take a little extra pigment and the prints may be blotchy, but once the brush and block are charged with colour it is surprising how little pigment is needed. The *baren* forces the colour deep into the fibres of the paper which, being damp, soak it up readily. Inking has to be done fairly quickly otherwise the colour will dry on the block.



Slotting the paper into the *kentō* holding it up from the block with the forefingers and middle fingers.

Holding a dampened *hake* upright (or *marubake* for larger areas) the pigment and *nori* are worked in a circular movement keeping within the 'moat' at all times. Particular care should be taken to ensure the carved edges are clean and there are no blobs of pigment lurking as they will print and spoil the sharp line. If the carving is very fine, as in a keyblock, the tip of the brush should be used to clear the lines. The final brushstroke should be **across** the grain leaving the thinnest film of colour on the surface. Brushing with the grain

Placing the paper

Paper for printing should be prepared and kept face down between moistened sheets of cardboard/paper in front of the print table. A sheet is taken from the pile, carefully slotted into the *kentō* and lowered onto the block, smooth side down. To avoid confusion, mark a X in the *kagi kentō* corner on the back of the paper with a pencil. The trick of holding the paper and stopping it from flopping prematurely onto the block lies with the forefinger and middle finger of both hands (see photograph left and page 80).

The thumb and fourth fingers are placed either side of the paper exactly where the *kentō* are positioned and are used to place the paper first in the *kagi* then in the *hikitsuke kentō* and hold it still. Meanwhile the forefingers and middle fingers are working like the blades of scissors and holding the paper proud of the block. When the position in the *kentō* is right, the paper will fall into position exactly, just by removing the forefingers and middle fingers and holding the *kentō* position with the thumbs. There is no doubt that this takes practice but it very soon becomes second nature. As soon as the paper is on the block, it is important to work quickly. If the paper stays on the block too long, there is a danger that the surface fibres of the paper will lift and/or the print will stick because of the *nori*. If this happens, the block should be washed.



Removing the fingers and allowing the paper to fall onto the block.

Rubbing with the *baren* and lifting the print

Holding the print lightly against the *hikitsuke*, the oiled *baren* is rubbed straight over the back of the print starting with a swift stroke into the *kagi kentō*. This secures the print before a stronger rubbing using either *kimekomi* or *mawashi baren* (see diagram page 58). Many artists slip a sheet of tracing/cooking paper (*ategami*) between the print and *baren*.



Pressing with a disc *baren* (a sheet of tracing paper is placed between print and *baren*).



Lifting the print swiftly from the block.

This eases the movement and helps reduce the chance of the *baren* catching on the paper and the print moving off register. The most common beginner's mistake is to assume that the paper will move and to hold it down with the fingers while rubbing with the *baren*. Any points of pressure other than the flat *baren* will show clearly on the printed area. If there is any doubt as to whether the impression is good, half the print can be lifted from the block and checked. If the impression is poor the block can be re-inked and printed again. Accurate *kentō* will ensure an accurate second impression.

When the print is ready, it should be lifted firmly and swiftly from the block and kept damp (face up) in the *otosu/hawasui* formation (see diagram page 49) until ready for the next colour. While printing, it is important to keep the moisture in the print even. If complete, the print can be dried under weights. Although freshly printed, the colour does not come off the surface because the tiny amount of pigment has been forced into the paper by the *baren*. If there is a lot of colour on the print surface, then there was probably too much pigment on the block. The ideal printed surface appears almost dry because the colour has effectively become one with the fibres of the paper. The amount of *baren* pressure needed for a good print depends on the effect required. The colour can be seen coming through to the back of the paper giving an indication of the impression. Large areas of flat colour, for example, will need a heavy textured *baren* and considerable pressure while a delicate outline will need much less effort. Controlling the *baren* pressure comes with experience as it changes with the paper used and the type of print. This basic technique of printing applies to both keyblocks and colour blocks.

Problems

Ketsuochi

These are marks printing from areas which have not been cleared properly. Check the depth of the cleared areas and make sure that the paper is not sagging and the *baren* is running flat across the printing surfaces. Small folded pieces of paper/cloth placed on the block can act as 'islands' to support the paper if necessary. Care should also be taken not to use too much colour when inking up.

Tamari

Tamari occurs when the edge of the cut area does not print clearly because of a build-up of pigment. Reduce the amount of colour and *nori* used and take care when brushing to clear the edges before printing. If the colour is too thick it is pushed over the edge by the pressure of the *baren*. On thin line blocks very little colour should be used and no *nori* at all. Careful brushing is also important to clear the lines before printing.

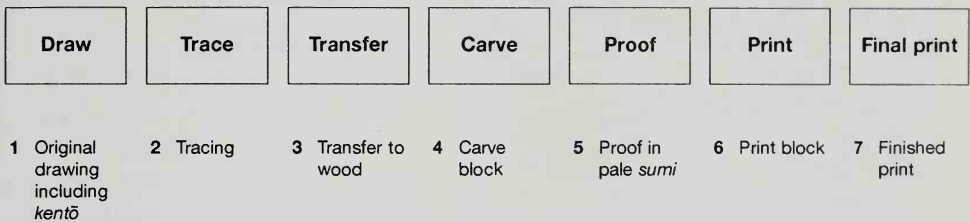
Hekomi

These are marks in the print caused by *baren* pressure on uncut parts of the block (such as the edge of the 'moat'). Check that all edges have been chamfered and softened using the *aisuki/sōainomi* and/or sandpaper.

The next two sections will cover the step-by step process for single and then multicoloured prints.

Making a single colour print

Principles of single colour print



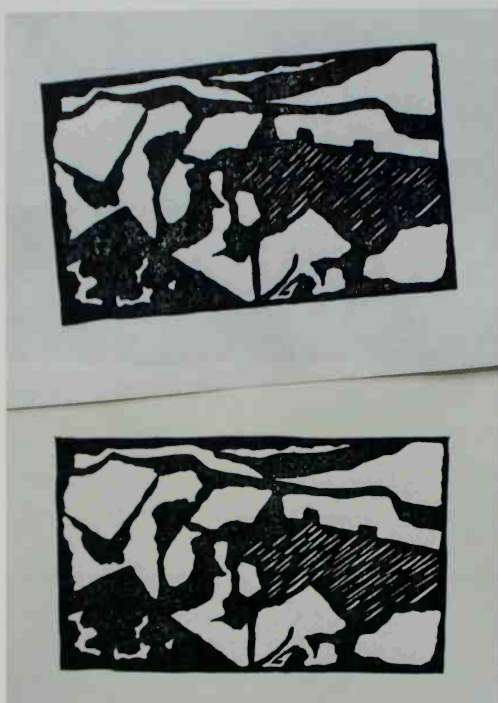
PRINT A (see page 62)

A single colour print is the easiest way to practise the basic techniques. The original sketch can be in pencil, ink, paint, computer generated or drawn directly onto the block. *Kentō* are not strictly necessary as there is only one colour, but including *kentō* helps with placing the paper and also gives the option of a second impression if the first is too pale. The directions for transferring the image and carving the block should be followed (see pages 64-75) then a trial proof taken to see if any adjustments need to be made. It is advisable to use a pale colour such as thin *sumi* for the trial proof as it would be hard to remove a strong colour from the block if it was not the colour chosen for the final print.

Trial print

To take a trial print, ink up the block with pale *sumi* (no *nori* is needed) as outlined in the previous section. The sheet of paper should be ready to hand, but for single colour prints, as there is no colour registration, it does not need to be moistened but damp paper is easier to print. If you have decided to use *kentō* (even for a single colour) this will make placing the paper easier. If not, line it up with one edge of the block and drop it gently onto the block. **Do not** press down with your fingers.

Compare the trial print with the block and make a note of areas which need adjustment. There may be ridges in the cleared area which are



The finished black and white print
on two types of paper

Top: *kōzo*

Bottom: *torinoko*

printing and need to be shaved using the *aisuki*. Alterations should be made when the block has dried naturally. Before moving on to the final printing it may be necessary to make further trial proofs. As there are no problems of registration with a single colour block, it is possible to use a cheaper paper for proofing and only progress to the expensive papers when you are fully satisfied with the block.

Printing an edition

When you are ready to print an edition, prepare the work area as outlined earlier. The paper should be cut to size and enough colour should be mixed. Finished prints need to be pressed between blotters of fresh newsprint/tissue and dried slowly overnight. When printing has finished, the block should be washed carefully, wrapped in newspaper and stored vertically.

Making a multicolour print

In the full-colour print the craftsmen carvers and printers pushed the technique to its limits and undoubtedly produced one of the glories of Japanese art.

Colour prints can be divided broadly into two methods:

1 Outline method

PRINT B (see page 63)

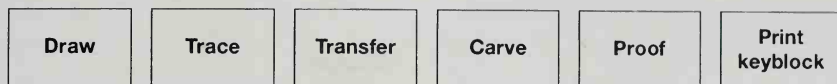
The design has a strong outline, a keyblock, which is cut and used as a master to carve the colour blocks which are then slotted in rather like a stained glass window. This was how the majority of *ukiyo-e* were printed. Although accuracy is of course important, the black line of the keyblock will cover tiny spaces between the colour blocks and hold the composition together. The thicker the outline, the easier it will be!

2 Jigsaw method

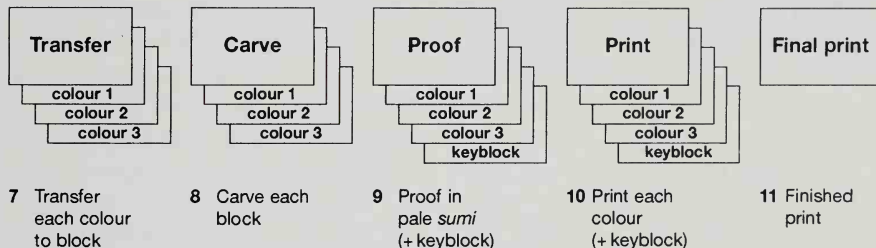
PRINT C (see page 63)

There is no outline or keyblock so the colour blocks are cut to fit directly next to each other rather like a jigsaw. This method obviously requires very accurate registration as there is no line to conceal the join between colours and any white spaces will show.

Outline method – PRINT B



- 1 Original drawing for keyblock with *kentō* marked
- 2 Tracing or scan
- 3 Transfer outline to block
- 4 Carve keyblock
- 5 Proof
- 6 Print keyblock including *kentō* (4 copies, one for each colour, one as colour master)



Principles of outline method (3 colour print plus keyblock)

The keyblock (*sumiban*)

The aim of the keyblock is to produce a master outline from which the colour blocks can be traced and carved. Traditionally the artist's original drawing on thin paper was pasted to the block, *kentō* were added and the block was carved. The carbon paper method is now more commonly used. The drawing (with *kentō*) should be transferred using the methods outlined. In order to guarantee good registration, the *kentō* must be accurate.

The carved keyblock **including** the *kentō* is inked up with *sumi* and printed either on thin *washi* (for traditional method) or ordinary *washi* for the other methods. The *kentō* must be printed to show their position in relation to the image. If any alterations need to be made to the keyblock, they should be done at this stage and another print taken. This keyblock

print (*kyōgō*) is marked to show the colours for the blocks. Generally, blocks are restricted to one colour, but if two or more colours are far enough apart in the original drawing they can be cut on the same block and inked up separately. Bear in mind that each carved area needs a 'moat' of at least 3cm (1in.) for inking up. If several colours can be fitted onto one block, it obviously saves on wood and carving time. Also, in order to increase the number of colours, a particular block can be overprinted in another colour – producing a third.

Preparing the colour blocks

Traditional method

In the traditional method, an impression of the keyblock with *kentō* (*kyōgō*) on *usumino* paper, was pasted onto each block. If the print needed six colours, for example, then six *kyōgō* would be taken and each one indicated with the relevant colour before being pasted onto a block (see page 65). All the colour blocks with *kentō* would then be carved following the centre of the black outline.

Alternative methods

Laser print

A print from the keyblock with *kentō* is scanned into the computer and printed out using a laser printer. One sheet is needed for each block. The laser print is reversed onto the block and the relevant line (and *kentō*) transferred using the tip of a hot iron as laser print ink is heat sensitive. Some photocopy inks will also work. Each block is then carved following the centre of the outline.

Carbon paper

Take a *kyōgō* as before and then transfer it to tracing paper either by hand or by scanning it in and printing out on tracing paper. Reverse the tracing onto each block in turn and, using carbon paper, trace the relevant section and *kentō*. The traced line should follow the centre of the outline. This method is simple but requires very accurate tracing.

Proofing

When all the blocks have been carved, take a test print of the colour blocks using thin *sumi* finishing with the keyblock in black. The colour blocks should meet neatly under the black outline. After a complete proof has been taken, check for any adjustments which need to be made and mark them on the proof. Dry the blocks naturally before attempting to re-carve any areas. If there are no alterations, the blocks are ready for printing in colour.

Printing

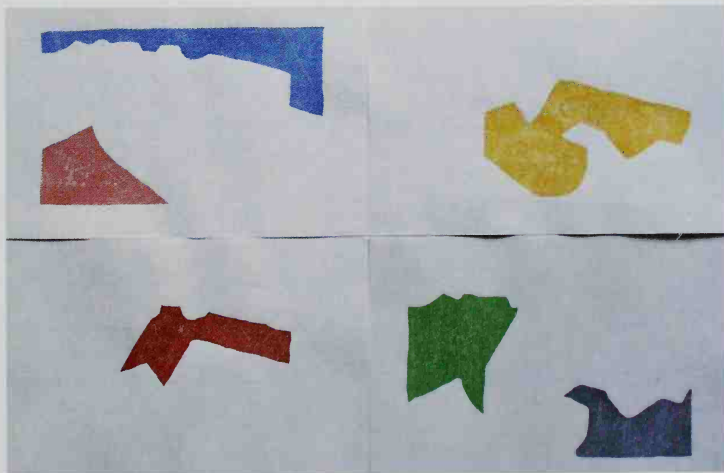
Before starting to print, prepare the workshop and mix enough of all the colours with, if possible, a separate *hakobi* and *hake* for each colour. The paper should be cut to size, dampened and kept damp between printing each colour otherwise the registration will be out. It is very important to monitor the dampness of the paper, especially in summer, spraying the newsprint pile from time to time with water to stop it drying out. If the prints dry out by accident, they can be dampened again as before (see page 48).

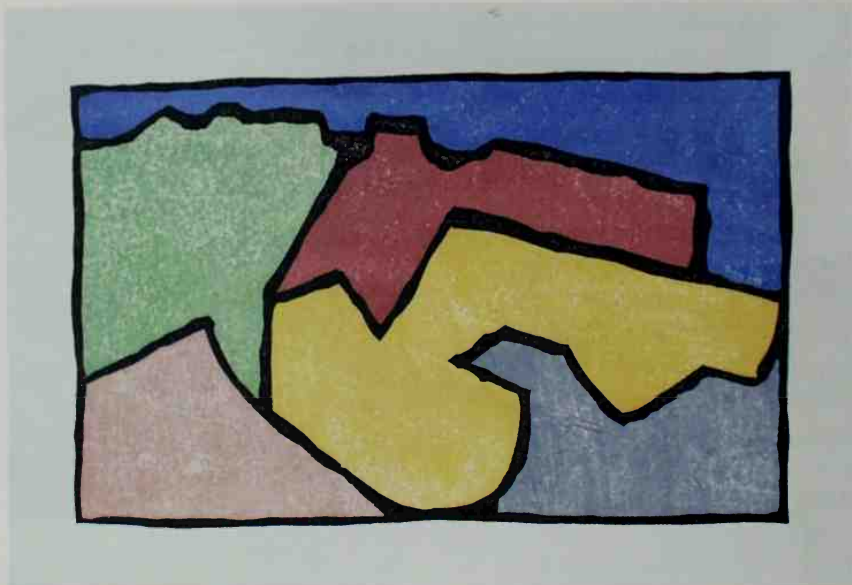
The method of printing is exactly the same as already described. The order of printing generally starts with the lighter colours, then dark colours and general background last.

Below: each of the four colour blocks used in Print B, printed on a sheet (two of the blocks have two colours separately inked).



Print B The three stages of the print (from top to bottom): pale *sumi* proof without keyblock; pale *sumi* proof with black keyblock; finished colour print.



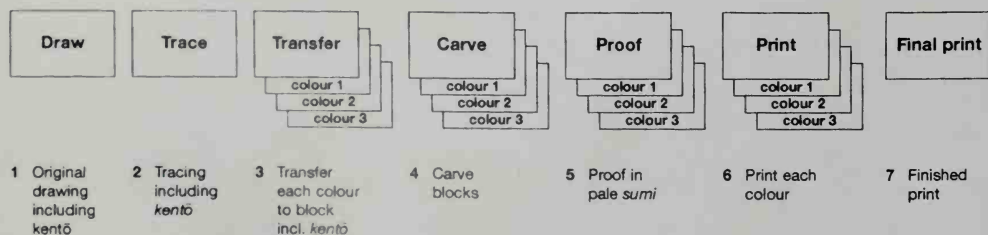


The finished Print B on *torinoko* paper; four colour blocks (six colours) plus black keyblock.

If possible, the order of blocks should be such that moisture is equalised all over the print. If two or more colours are on the same block, they should be inked up and printed separately. In *ukiyo-e* the outline was traditionally printed first, followed by the colour blocks. It is usual now to print the colours first and finish with the outline block. Opaque colours such as gouache would obscure the outline if it was printed first. Embossing blocks should also be left to the end.

The complete edition of each colour should be printed before moving on to the next block, keeping the prints damp in between. When the edition is complete, the prints should be dried under weights.

Jigsaw method – PRINT C



Principles of jigsaw method (3 colour print with no keyblock)

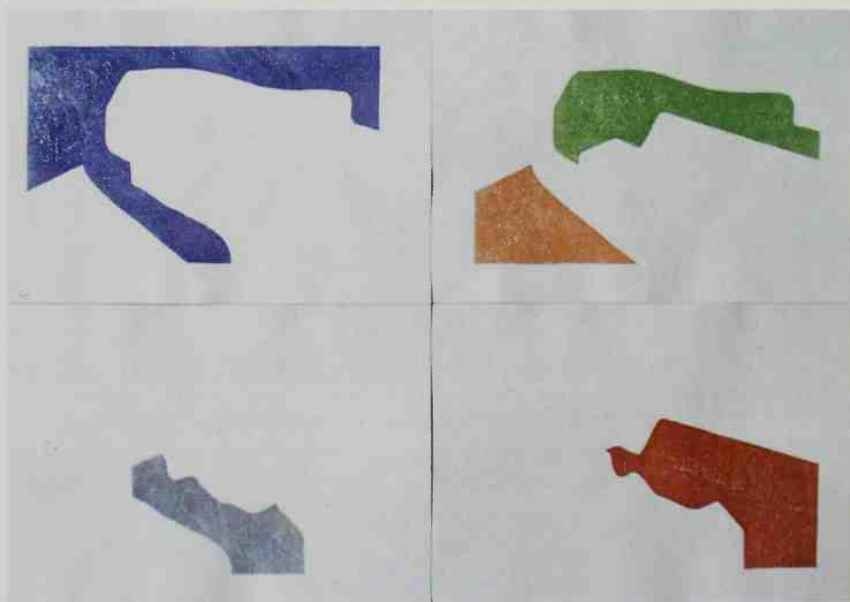
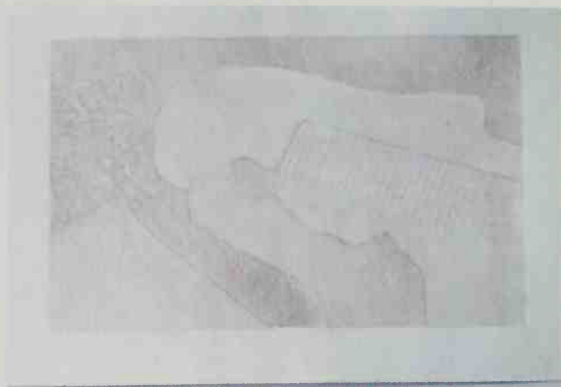


Print C

Above: a single block with two carved areas inked up and printed separately.

Right: two stages of the print; pale *sumi* proof and coloured finished print.

Below: each block printed separately. The print has five blocks (four colour blocks shown and one embossed). The embossed block was printed before the red block so that the texture shows as white.



The absence of an outline block to hide any mistakes in carving/registration makes this a technically more challenging method. As there is no keyblock, a tracing is made (including the *kentō*) from the original drawing. When the colours have been decided, the outline tracing of each section (and *kentō*) needs to be transferred to the blocks. This has to be very accurate as there will be no black line to cover the join. The tracing can be transferred to each block using either a laser print and hot iron or carbon paper as in method 1. When carving blocks for the Jigsaw method, it is safer to follow the outside edge of the traced line allowing extra all round. The proof in thin *sumi* will clarify adjustments needed. If it is cut too large, it is easy to cut back the edge to fit. If, however, a colour block has been cut too small and background white is showing, then unfortunately it has to be re-cut.

Faults in registration can be rectified by careful adjustment of the *kentō* (see page 81) but if there are no further changes, the blocks are ready to be editioned as described in the Outline method.



The finished Print C on *torinoko* paper; four colour blocks (five colours) plus embossed block.



Heart Box IIIII, Caleb Brown, USA. 92 x 61cm, 1990.

This print is on handmade *kōzo* paper and uses traditional Japanese water-based technique but with non-traditional carving. Brown works fairly quickly across the block, the cut marks imitating cross-hatched shading. The ridges in the cleared areas have been kept, inked up and printed as an essential part of the composition. The print has a keyblock and one colour block.

Chapter 4

SPECIAL TECHNIQUES

Carving effects, printing effects

Carving effects

Chinese woodblock was predominantly used to reproduce paintings, imitating as closely as possible the effects of brush on paper. There are two carving techniques (*itabokashi* and *sabitsuke*) which are used in the Japanese woodblock tradition to create some of these painterly effects of light and dark, and brush texture. The Kyōto style of woodblock, which was often used to print copies of traditional Japanese-style paintings, makes particular use of these techniques.

***Itabokashi* (block gradation)**

Gradation (*bokashi*), particularly in landscape prints is a characteristic of Japanese woodblock but mostly it was achieved through printing (see Printing effects, page 102). *Itabokashi*, however, is a carved way of achieving a softened edge instead of a sharp cut line. The advantage of *itabokashi* is that once it has been carved, the block can be inked up and printed as normal giving a greater consistency than is possible with most printed *bokashi*. *Itabokashi* was often used in kimono patterns and to enhance the appearance of the extraordinarily fine hair in many 'beauty' prints. The hair on the original drawing would be no more than a brush-stroke and it was left to the skill of the senior carver to bring it to life. The hairline block would be carefully chamfered using the *aisuki* to give a subtle change of colour and texture.

Itabokashi is formed on the block by carefully shaving the cut edge into a gentle slope. The line should be cut about 5mm larger than the tracing because the chamfering will move the position of the line back. When the enlarged shape has been cut and the area cleared, using the *aisuki* or *kentōnomi* carefully shave the printing edge to a gentle slope fading from the original line position. The gradation varies with the angle of the slope. Shaving to a slightly uneven line will give a softer effect when printed. The chamfered area is then polished with *tokusa* (*Equisetum*, horsetail). The *tokusa* is cut into short lengths, folded into four and then dried. Before use it is soaked briefly in water. If *tokusa* is not available, 600 grade wet and dry paper can be used instead. The block is inked as normal and printed with a light *baren*. The colour should fade gently away from the line (see illustration opposite).



The stripes on the kimono are printed in *itabokashi*. The leaves are carved using *sabitsuke*.



The brushstroke is carved using *sabitsuke*.

***Sabitsuke* (brushstroke)**

This method of carving results in a remarkably realistic brushed line. It is also called *kasure* and first appeared in the late Edo, early Meiji period. It is often claimed that the closest imitation of a real brushstroke results from carving the line in the same direction as it was drawn. It is broadly divided into two; *nagaresabi* which is the main flow of the brushstroke and *tomarisabi* which is the point at which the stroke ends and bleeds into the paper. The carving technique itself is the same for both elements but the finished effect should reflect the differences in the character of an actual stroke. The main parallel lines of the brushstroke should be cut as normal using the *hangitō* following the tracing. The lines should be slightly thicker than normal and can be cut using the *sankakutō* for speed.

Next, using the tip of the *hangitō*, short, random irregular cuts are made across the carved lines giving a jagged edge effect. It is important to change the direction of the *hangitō* and not be too even or the result will look artificial. Also, it may be worth monitoring progress by taking a trial print with pale *sumi*, drying the block and carving some more. *Sabitsuke* tests the expertise of experienced carvers, so do not be too disheartened if it proves difficult.



Tokusa (horsetail) used to chamfer the block for *itabokashi*.

***Kōshime* (net pattern)**

In *ukiyo-e* prints mosquito nets, tousled hair and fine tree branches were all cut using this technique which calls for very good quality wood. It is, of course, possible (but hugely time-consuming) to carve a grid pattern but the printing would not be very easy. Pigment would build up in the corners and the lines would look thick or smudged. The normal method is to cut two blocks; one with horizontal lines, one with vertical. First trace and carve the horizontal lines and *kentō* onto one block, then do the same on another block with the vertical lines. Traditionally only a *hangitō* was used, but the *sankakutō* would be quicker although it would give a coarser effect. The blocks should be inked and printed as normal taking particular care when brushing and clearing the colour. The two blocks comprising the mosquito net would generally be printed last.



The two blocks used to print the mosquito net (see opposite).
(Courtesy of Kaneido, Kyōto)



Detail from a reprint of Utamaro's *A Woman Reading in a Mosquito Net*.
This shows clearly the fine lines of the net covering the face.
(Courtesy of Kaneido, Kyôto)

Printing effects

Gradation (*bokashi*)

The most well-known printing effect in Japanese woodblock is colour gradation (*bokashi*) made famous in the prints of Hokusai and Hiroshige using imported Prussian blue. The range from light to dark, pale to deep gives a wonderfully stylised suggestion of sky or water and a tremendous feeling for space.



Dampening the block with water using a *zōkin* before printing *bokashi*. The block had already been used to print the *ōbokashi* background in a re-cut of the blocks for Hiroshige's *Suido Bridge, Suruga terraces* from *One Hundred Views of Edo*.

Bokashi can be achieved in two ways: using brushed pigment, covered in this section, and by carving *itabokashi* (see page 98). *Itabokashi* is more consistent but the gradation of the colour is not as marked. Brushed or wiped *bokashi* (often called *fukibokashi*) has a softer feel to it but as the brushing of each block may vary slightly, it is hard to achieve complete consistency across an edition. *Fukibokashi* has the advantage that it can be printed from any flat block; for example, the sky would be printed first in pale blue then the same block used for the darker *bokashi* on top.



Attractor, April Vollmer, USA. Edition 25, 38 x 41cm, 1996. This print is made up of four blocks, uses nine colours and thirteen printing steps building up the *bokashi* in the centre of the flower. It is printed on double weight *kizuki hanga washi* because of the number of printings. Maintaining even moisture across the print between the *bokashi* centre and the edges is important.

Small areas can be printed using a *hake*, larger areas, a brush or folded cloth. Printing large editions, the block would need to be washed every now and again to prevent clogging. A successful *bokashi* shows the combination of wood, pigment and paper at its very best.

Ichimonji bokashi (straight-line gradation)

This is the *bokashi* of Hokusai and Hiroshige and gives a strong horizontal fade across the print. The background would be printed first and then the same block used for the *bokashi*. To achieve this effect the block should be dampened with a folded cloth (*zōkin*) across the area to be shaded. The aim is to brush colour into the water so that the two fade into a gentle gradation by loading one end of a damp brush with colour, the other end just damp with water. To avoid confusion, mark one end of the brush and if possible use a printing brush as broad as the area to be printed or a folded cloth.

Apply a little *nori* to the block along the colour line with a stick before loading one end of the brush using the *hakobi*. Alternatively a few dabs of colour can be placed on a tile and the brush loaded from there. When brushing, care should be taken to keep one end of the brush for the colour and the other end for the water. The colour will migrate naturally towards the water. The direction of the grain of the block (which depends on how the image was placed before being carved) affects the appearance of the *bokashi*. If you are brushing



Applying colour to the block for the *ichimonji bokashi* using one end of the *marubake*.



The re-cut print of Hiroshige's *Suido Bridge, Suruga Terraces, in progress*, showing the *ōbokashi* and *ichimonji bokashi*.

with the grain, the *bokashi* will be smoother than if you are brushing across the grain. The first impression may look a little disappointing as not too much *baren* pressure should be used. *Bokashi* prints better when colour has built up in the block so it can be printed several times using the *kentō* registration to give that wonderful transition from deep to pale.

***Ichimonjimura bokashi* (straight-line *bokashi* with a wavy edge)**

This *bokashi* is the same as *ichimonji bokashi* except that instead of brushing in a straight line the brush is moved in an irregular motion giving an uneven edge to the gradation. This effect was used particularly to suggest rainy or stormy skies in, for example, Hiroshige's *One Hundred Famous Views of Edo*, *A Sudden Shower over Ōhashi and Atake*.

***Ōbokashi* (broad gradation)**

This is a very broad version of the basic *ichimonji bokashi*, but requires considerable skill. To get a uniform fade-out, it takes several impressions: effectively printing *ichimonji bokashi* repeatedly across the area using brushes loaded with different amounts of colour. The first impression should be the broadest and palest, working slowly back from that position to the deepest colour.

Ōbokashi will give broad gradation across a wide area (e.g. Hiroshige's *One Hundred Famous Views of Edo*, *The Plum Gardens at Kameido*) rather than a dramatic sky/horizon strip as in *ichimonji bokashi*.



Three *fuda* showing examples of *bokashi*. On the left, the two colours are worked towards each other to meet in the middle (*futa iro bokashi*).



Night Scene in Saruwaka-cho (Saruwaka-cho yoru no kei)
 from *One Hundred Famous Views of Edo*, Andō Hiroshige, Japan, c1856-8.
 Impressions of this print vary, but this one shows a clear example of *atenashi bokashi* in the cloud drifting past the moon. It is also interesting in the use of shadows and experiment with a vanishing point which indicate Western influence.
 © The British Museum.

Futa iro bokashi (two colour gradation)

In this technique two colours are worked towards each other with the usual *bokashi* technique. Either use two separate brushes or have a colour at each end of the brush. If the colours meet in the middle, put a dab of nori down the centre line and a third colour will result. If the colours are not to meet, put a little water down the centre and work towards that from both ends.

Hakkake bokashi

This *bokashi* is used in specific areas over the top of another colour, for example shading at the peak of a mountain. The same block can be used, printing normally first, washing the block and then overprinting with *bokashi* in another colour. This effect can be seen in the shading at the peak in Hokusai's *Mount Fuji in Clear Weather* (known as *Red Fuji*).

Fukiage bokashi (line bokashi)

This *bokashi* is used to shade colour from a line and is a variation of *hakkake bokashi*. A small *hake* is used and colour is brushed lightly up and just over the edge of the dampened block. This *bokashi* is often used round the moon as in Hiroshige's *One Hundred Famous Views of Edo, Kyō Bridge and Bamboo Bank*.

The next four *bokashi* do not use a cut block and so are freer in their interpretation.

Atenashi bokashi (shapeless bokashi)

This counts as a type of *bokashi* but it is very hard to keep consistency between prints. It is frequently used for floating clouds in skies. As the effect is achieved solely by brushing and there is no carved outline, a particular block does not need to be cut. The area to be printed should be dampened with a wet cloth and a drop of colour added, then brushed carefully with a *hake* which will spread the colour into the water. Each impression will inevitably be slightly different (see illustration page 105).

Kumadori bokashi (shading bokashi)

This is very similar to *atenashi bokashi* in that there is not total consistency between prints. It is often used to create delicate shading on the face, for example around the eyes. It can also be used to create a shadow behind an object or a shaded background. Using a folded wet cloth, lightly dampen the area to be printed. Draw over that area using a brush loaded with pigment: it will run naturally into the water. Using a clean printing brush, gently brush the edges of the colour to soften and then print.

Fukibokashi (spray bokashi)

Confusingly this has the same name (though a different Japanese character) as wiped *bokashi*. This *fukibokashi* is less widely used and is more basic. A stencil is cut and placed over the area to be sprayed and



Midnight Arabesque, Kurosaki Akira, Japan. Edition 50, 55 x 80cm, 1980.

This complex print is on Echizen *torinoko* paper using 16 blocks and 10 colours and shows a wonderful combination of areas of flat colour with *bokashi*.

colour is then flicked on with a brush or through a diffuser. It is hard to achieve consistent results.

Baren bokashi

A simple but rather unsophisticated *bokashi* can be achieved by altering the pressure of the *baren* across the print from hard to soft. The printed colour will fade accordingly.

Flat colour

***Betazuri* (flat colour)**

This technique gives the classic rich, flat colour mostly used in the background of *ukiyo-e*. It is also called *tsubushi* or *jitsubushi* from the Japanese for 'crush' and is considered to be technically very demanding. The secret is getting the amount of pigment, water and *nori* just right, they should all be applied fairly generously and brushed on energetically with a large brush. A strongish *baren* is used with considerable pressure, forcing the colour deep into the fibres of the paper. Extra pressure is applied at the end of the stroke of the *baren*. Because of the amount of *nori*, it is important to work quickly or the surface of the paper will stick to the block.

Two or more impressions will improve the depth of colour. Opaque pigments give a slightly heavy feel but are easier to print. Transparent colours can be printed several times to produce a rich translucence. Dark colours such as indigo and black, if printed thinly, are likely to show the grain of the wood.

Brush stroke printing

This is similar to *betazuri* except that the amount of *nori* is increased until the brushstrokes are clearly visible in the pigment on the block. Again, speed is very important when printing for this effect as the excess *nori* will pull up the surface fibres of the paper or stick it to the block. The block is cleared with the grain leaving strong brushmarks in the colour which will differ between prints.

Barensujizuri (baren mark printing)

This technique is named after the marks left on the print from strong use of the *baren*. These marks show particularly clearly in *betazuri* and for this technique the same application of colour and use of heavy *baren* pressure applies. The difference lies in the nature of the *baren*. To leave clear marks, the inner coil of the *baren* must be fairly rough-textured: for example, a 16-strand *baren*. Home-made *baren* using batch chain or plastic cord can also be effective. The marks left will obviously depend on the movement of the *baren* (circular or zigzag), the amount of pigment/water on the block, and will differ from print to print.



Print C printed using *gomazuri*
(no *nori*, wettish colour).

Gomazuri (sesame printing)

Gomazuri gets its name because it looks as if sesame seed has been sprinkled on the print. It is basically what happens when *betazuri* does not print properly. The other name for this technique is *kozōzuri*, from the Japanese word for 'youngster', because originally this effect was produced inadvertently by the apprentice printer trying to print flat colour. It is now seen as a technique in its own right, but is not easy to keep consistent across an entire edition. It happens more easily on rougher wood. In *gomazuri*, no *nori* is used

on the block so the pigment particles remain suspended in the water and when printed appear as tiny spots.

The fineness of the speckles depends on two further factors: the pressure of the *baren* and the dampness of the paper. Heavy *baren* pressure gives a finer texture than very soft *baren* pressure. The softest effect of all is achieved by just letting the paper rest on the block and absorb the colour. Damp paper gives softer definition to the spots than drier paper. Likewise, weakly sized paper will give a softer effect. *Kōzo* papers are particularly suitable.

To print *gomazuri* apply a small amount of fairly watery colour (no *nori*) to the block and mix well with a damp brush. Print one or more times to achieve the desired effect. *Gomazuri* is best printed as the first impression on unprinted paper, other colours being added afterwards.

Texture

Mokumezuri (wood grain effect)

Because the grain of the cherry blocks was so fine it rarely showed in traditional prints, although occasionally it can be seen in areas of flat colour or as a texture on kimono. Printing the grain across a whole edition required considerable skill. In contemporary prints, woods such as pine and cedar are used specifically for their grain. To further emphasise the grain, it can be enhanced by brushing with a wire brush or even scorching. The block is inked up and printed as usual but with a strongish *baren*. Strong grained woods such as pine need less pigment and *nori*, softer grained woods like zelkova should be printed like *betazuri*. Grain can be seen clearly in Hiroshige's *One Hundred Famous Views of Edo*, *The Komakata Hall and Azuma Bridge*.

Karazuri (embossing)

This technique was particularly used for producing subtle textures on kimonos in traditional prints and is very effective using thin lines. Embossing over a printed colour results in a rich light and shade effect. The embossing block should be printed last and has to be specially cut for the purpose. Lightly wet the surface of the wood with a water brush and then print using fairly heavy *baren* pressure. Embossing works better on dampened, slightly heavy paper. The block needs to be kept moist throughout or else the paper will slip. If the embossing is done first and overprinted, the texture will show as white marks. *Baren* pressure should be much softer for subsequent printings in order to preserve the embossing (see right).



Detail of a print (artist unknown) showing clear embossing on the collar.

In addition to carved embossing, textured cloth/string can be glued onto the block and printed in the same way.

***Kimedashi* (heavy embossing)**

This is a bolder version of *karazuri* which produces a deeper but softer embossed mark on larger areas. It was frequently used in traditional prints to represent the bulging muscles of sumo wrestlers or the soft flowers of the cherry blossom. The method is the same as for *karazuri* except that the thickish dampened paper is forced down into the texture of the block by pressing with a ball of cloth, an eraser or even the elbow rather than with a *baren*.

For very large prints the heel of the foot can be used. Because the paper is forced so deeply into the block, the surface of the cleared areas should be neat as it will show. Care should be taken when drying embossed prints as heavy weights will flatten the texture.

Rhythm 1999, Zhang Ke, People's Republic of China. Edition 15, 70 x 95cm, 1999. In his work Zhang Ke uses Japanese techniques alongside the traditional Chinese method of *takuzuri* (see page 111). Chinese paper is pushed into the relief of the carved block and pressed gently with a *tanpo*. The rich beauty of *sumi* is a feature of his work.



Reversed blocks

The following three techniques all use specially cut blocks:

Shōmenzuri (front printing)

Another name for *shōmenzuri* is *tsuyazuri* from the Japanese word '*tsuya*' meaning shine. This technique was often used, like *karazuri*, to add detail to kimono/textiles in prints. This would be the last process in the print. *Shōmenzuri* works by polishing a printed area of colour with a wild boar tusk while the dry print is resting on the special block and shows best in dark colours. The polishing brings out the *nikawa*/gum binder in the pigment. The texture cut in the block shows as shiny lines on a matt ground. If you do not have a wild boar tusk to hand, a spoon is an adequate alternative. As the print is placed on the block **face up**, a special block has to be cut by **not** reversing the tracing. The *kentō* will then be on the opposite side (i.e. the left). Before polishing the print, it should be dry so in order to keep the register accurate, the tracing for this block should be checked against a dry print and the block adjusted (see illustration page 113).

Takuzuri (rubbing)

Takuzuri originates from a Chinese method of making stone rubbings and can be considered a type of *shōmenzuri* as it uses a reverse block. A dampened sheet of paper is laid on the uninked block and gently pushed into the contours of the carving using a soft ball of cloth. *Sumi* is then dabbed on the paper using a *tanpo* (cloth wrapped round a ball of cotton wool). The ink should not be too thin or the colour will bleed and it needs to be applied sparingly to the *tanpo* from a tile. When the paper has dried a little, remove it from the block and allow it to dry completely. The print will have a fairly pronounced texture and reversed out colour. If desired, the texture can be removed by drying the damp print under a weight.



Applying *sumi* to the paper on the block using a *tanpo* for *takuzuri*. For a contemporary example of this technique see Zhang Ke's print (opposite).

Urazuri (printing from the back)

Like *shōmenzuri* this method involves cutting a block without reversing the tracing and using the paper **face up**. The colour is printed from the back, so the effect on the front of the print is very soft because it is seen

through the fibres of the paper. Unsized or lightly sized *kōzo* papers produce the best effect. Prepare a block in reverse as for *shōmenzuri* and ink it up with no *nori* and a lot of pigment and water. It will take fairly heavy *baren* pressure to force the colour through to the front. Fine cut lines do not work as well as larger areas. Because the paper is damp, the tracing and cutting of this block do not need to be altered as in *shōmenzuri*. (See illustration page 45.)



A fan printed with *nikawa*, sprinkled with mica and lightly dusted to remove excess.

In some prints the mica printed area was crumpled (*momigami*) and then flattened out again by re-sizing the back of the print and pressing it flat with a *baren*. The effect was rather like the crazing in an old Chinese ceramic glaze.

Powder colours

Kirazuri (mica printing)

The most well-known use of this technique is in the background of Sharaku's actor portraits (see illustration page 113). Mica was used because silver was too expensive and in many ways it was better because it did not discolour as easily. The background was often printed in a dark grey before being overprinted with *nori* or *nikawa* and sprinkled with mica while still wet. A stencil can also be cut and the masked area brushed with *nori/nikawa* and sprinkled. Excess mica is lightly shaken off, the print allowed to dry completely and then brushed gently.

The same technique can be used for gold, silver or bronze powder. If the mica or powders are mixed with the *nori/nikawa* and/or pigment and printed directly they lose a lot of their sparkle.

Opposite: *Tōshūsai Sharaku Actor*, head and shoulders of *Matsumoto Yonesaburo* as *Kewaizaka Shosho* with a pipe in her left hand. 1794–5. This print has a mica background typical of Sharaku and pattern in the black *obi* printed using *tsuyazuri*.
© The British Museum





Extract no. 83 with Figure of Expressions, Wayne Crothers, Australia. Unique state print, 180 x 180cm, 1999.

In recent work, Crothers has experimented with a variety of tools to cut with: grinders, routers, drills, jigsaws and conventional chisels to give the carving tremendous energy and vitality. The blocks are printed traditionally on *kôzo* paper using pigments and *baren*.



3 Dogs in a Truck, Sarah Hauser, USA. Edition 75, 21 x 31cm, 1999. This print was printed using Akua Kolor – a water-based printing ink developed for use for monotypes. Smaller areas (such as the tongues) have been combined on one block to save carving. Two of the dogs have embossed 'fur' texture over the colour blocks.

Chapter 5

DRYING, MOUNTING AND STORAGE



Drying

By the time a print has been through several impressions, the paper will begin to feel a little fragile and needs careful handling. It should be dried as naturally as possible. Immediately after printing the prints should be placed between sheets of newsprint/tissue under a light weight for an hour or so. This will remove a certain amount of the moisture. They should then be placed between cardboard sheets under a weight and left for at least 24 hours to dry out slowly. The weight on the prints should not be so heavy that it risks squashing any embossed areas.

If for any reason the prints have dried and are not completely flat, they can be straightened by carefully remoistening them between damp sheets of newsprint as before and then drying them again under a weight. The newsprint should be dampened with water by brush or spray and left for the moisture to spread through the sheets before the prints are layered in between. Any pools of water on the surface of the newsprint will mark the printed areas.

Mounting

Once the prints are dry, they can be cut to size using a steel rule and cutting knife for a straight edge. The size of the border on the *kentō* edge will be fixed (although it could be reduced) so the other two sides should be cut to match. To form a torn deckle edge on Japanese paper, place the metal ruler on the line, run a clean brush dipped in water along the edge and then tear the paper by pulling it back against the ruler. The fibres will pull leaving a soft edge similar to the original deckle.

There is not really a tradition of framing in Japan as works of art on paper are usually mounted on a backing as a scroll or a screen. This is adequate for temporary display, but for permanent exhibition a frame offers better protection.

Prints can either be mounted using acid-free hinges or paste under a cut window mount or floated in a frame on a backboard to show off the deckle edge. All materials used in framing should be acid-free and the glass should be away from the print surface.

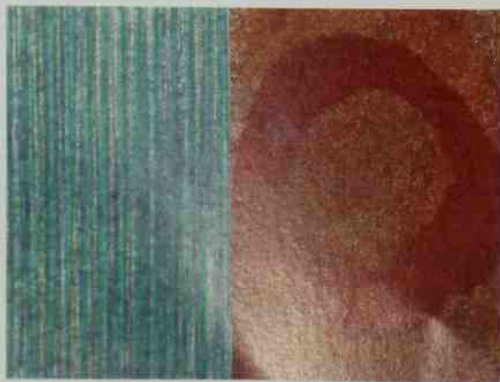
Storage and display

Japanese paper is susceptible to changes in humidity so the finished prints should be kept interleaved with acid-free tissue in a drawer or box. Also, because of the fugitive nature of many pigments, the prints should not be hung for long periods in bright light. Certain colours fade faster than others giving the print a completely different appearance than intended. This effect can often be seen in old prints where the more fugitive pale pinks and blues have almost completely disappeared. Other colours such as vermilion turn black over time, completely altering the balance of the picture. Prints should also not be hung over radiators or other heat sources.

One of the beauties, however, of Japanese prints as they age is the change in the colour of the paper. It develops a soft glow which seems to make the water-based colours even more vibrant as the colour has been forced right into the fibres of the paper by the *baren*. Over time, memories of struggles with the technique will fade as the completed print appears to grow in depth and luminosity.



Brush Circle I and II,
Rebecca Salter, UK.
Monoprints, 15 x 20cm, 1994.
These monoprints are made using a combination of carved and un-cut blocks onto which colour has been painted. These brushstrokes are unrepeatable so editions are not possible. The finished prints (on thin *kōzo* paper) are then cut and laminated before being trimmed to size.



COLLECTIONS

The following list is merely an indication of some of the larger collections of Japanese prints.

France

Musée Guimet, Paris

Ireland

Chester Beatty Library and Gallery of Oriental Art, Dublin

Japan

Tokyo National Museum

Ōta Museum, Tokyo

Hiraki Ukiyo-e Museum, Yokohama

UK

The British Museum, London

Victoria and Albert Museum, London

Fitzwilliam Museum, Cambridge

USA

Art Institute of Chicago

Metropolitan Museum of Art, New York

Museum of Fine Arts, Boston

SUPPLIERS

Many of the specialist materials are now available outside Japan, and Japanese suppliers are increasingly prepared to supply by mail order abroad.

UK

Falkiner Fine Papers
76 Southampton Row
London WC1B 4AR
Tel: 020 7831 1151
Fax: 020 7430 1248
Email: falkiner@ic24.net
(paper, paste)

Intaglio Printmakers
62 Southwark Bridge Road
London SE1 0AS
Tel: 020 7928 2633
Fax: 020 7928 2711
Web site: www.intaglioprintmaker.com
(specialist supplies including
mail order)

John Purcell Paper
15 Rumsey Road
London SW9 0TR
Tel: 020 7737 5199
Fax: 020 7737 6765
Email: jpp@johnpurcell.net
Web site: www.johnpurcell.net
(specialist printmaking
paper)

R. K. Burt & Co. Ltd.
57 Union St
London SE1 1SG
Tel: 020 7407 6474
Fax: 020 7403 3672
Email: sales@rkburt.co.uk
(paper)

T. N. Lawrence and Son Ltd
(mail order):
208 Portland Road
Hove BN3 5QT
Tel: 01273 260260
Fax: 01273 260270
Email: artbox@lawrence.co.uk
(specialist printmaking supplies)

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WA 98124-5568
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Fax: +206 224 0404
Email: dsartmtrl@aol.com

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Bergamot Station G9
Santa Monica
CA 90404
Tel: +310 998 0098
Fax: +310 998 0028
Email: hiromipaper@earthlink.net
Web site: www.hiromipaper.com

Kremer Pigments Inc

228 Elizabeth Street
New York
NY 10012
Tel: +212 219 2394
Fax: +212 219 2395
Email: kremerinc@aol.com
Web site: www.kremer-
pigmente.com
(pigments, mica, paste)

McClain's Printmaking Supplies

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PMB 202
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Tel: +800 832 4262
Tel/Fax: +503 524 9600
Email: orders@imclains.com
Web site: www.imclains.com
(specialist supplies plus mail order)

AUSTRALIA

Melbourne Etching Supplies

33a St. David Street
Fitzroy
Vic 3065
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Fax: +03 9419 6292
Email: etch@mira.net
Web site: www.mes.net.au

Neil Wallace Printmaking Supplies

44-46 Greeves St
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Vic 3065
Tel: +03 9419 5949
Fax: +03 9419 4232
Web site: e-artstore.com.au
(specialist supplies)

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Fax: +03 3393 6374
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Fax: +03 3920 2638
Web site: www.woodlike.co.jp
(specialist supplies including mail
order)

**Note: this book cannot cover all
aspects of the techniques in detail.
For further information try the
informative web site for
enthusiasts:
www.barenforum.org**

GLOSSARY

Ai	indigo
Aibō	a stick of indigo
Aigami	paper dyed with blue from <i>tsuyugusa</i>
Aisuki	flat-bladed tool
Akane	madder made from <i>Rubia akane</i>
Arato	rough whetstone
Ategami	a sheet of shiny paper placed between <i>baren</i> and print during printing
Ategawa	laminated back to the <i>baren</i> which holds the <i>shin</i> (coil)
Atenashi bokashi	shaded printing not in a fixed area
Azusa	Catalpa wood mainly used for printing in China
Baren	printing pad made from a coil, back and cover
Baren bokashi	rough <i>bokashi</i> using different <i>baren</i> pressure
Barensujizuri	printing which shows the marks of the <i>baren</i>
Bengara	red/brown iron oxide based colour
Beni	a red/pink colour from safflower
Beni-e	literally 'red picture' – an early print in which the pink/red (<i>beni</i>) was applied by hand
Benizuri-e	early print where two colours (red and green) were printed
Berōai	imported Prussian blue
Betazuri	flat colour printing, often used for backgrounds (also <i>tsubushi</i>)
Bokashi	gradation
Bokujū	liquid <i>sumi</i> (ink)
Burashi	horsehair brush (<i>marubake</i>) for mixing the pigment on the block
Byakuroku	green from ground malachite
Chojiro	pale yellow/red/brown
Chūban	paper size (26.5 x 19.7cm approx.)
Chūto	medium whetstone
Daidaiiro	orange colour
Dasu	literally 'push', meaning to move the <i>kentō</i> away from the printer (towards the picture area)
Dōbori	literally 'body carving' i.e. general carving of the block not carried out by the most skilled carvers
Dōrokushō	green from verdigris
Dōsa	size for paper made from gelatin/animal glue, water and alum
Dōsabake	broad brush used for sizing paper
Edo	former name for Tōkyō. Edo era was 1603–1868
Enji	pink/red colour
Enpaku	white from lead carbonate
Fuda	printed name cards/advertisements
Fukiage bokashi	shaded printing up from a line
Fukibokashi	brushed <i>bokashi</i> (also spray <i>bokashi</i>)
Fune	vat used in papermaking
Futa iro bokashi	two colour gradation

Gampi	fibre for papermaking from <i>Diplomorpha Sikokiana</i>
Ganryō	Japanese powder pigments
Gasenshi	Chinese-style paper made with short fibres
Gofun	white pigment made from crushed shells
Gomazuri	printing with speckled effect like sprinkled sesame seeds
Gunjō	blue from ground azurite
Hake	horsehair brush with handle for mixing colour on the block
Hakkake bokashi	gradation printed as emphasis over other colours
Hakobi	brush used to carry pigment to the block
Hanga	a print
Hangi	wood printing block
Hangitō	bevelled cutting knife (also <i>kiridashi</i>)
Hankusa	paper using pulp mixed with fibre
Hanshita	preparatory drawing on thin paper which is pasted onto the block
Hawasu	staggered way of laying out damp prints/paper
Hekomi	unwanted marks showing on a print from raised areas
Hikitsuke	the 'straight' <i>kentō</i> mark on the long edge of the block
Hiku	literally 'pull' meaning to move the <i>kentō</i> towards the printer (away from the picture area)
Hō	<i>Magnolia obovata</i> used for blocks
Hodomura	<i>kōzo</i> paper
Hōsho	<i>kōzo</i> paper particularly suited to printing
Hosokawa	<i>kōzo</i> paper good for single colour prints
Ichimonji bokashi	straight-line gradation. Often used in skies
Ichimonjimura bokashi	straight-line gradation with a wavy edge. Used in rainy skies
Itabokashi	gradation achieved through chamfering the edge of the block. Often used to show folds in garments
Jitsubushi	flat printed colour
Juniko	12 strand bamboo cord used in <i>baren</i>
Jurokko	16 strand bamboo cord used in <i>baren</i>
Kagi	right-angled <i>kentō</i> mark on right of block
Kakiiro	yellow/brown
Kakishibu	persimmon tannin
Karazuri	embossing often used as texture on garments
Kashirabori	literally 'head carving' – the most skilled carving
Kasure	scratchy carving effect (like brushstroke) also called <i>sabitsuke</i>
Katsura	<i>Cercidiphyllum japonicum</i> wood used for blocks
Kawa	bamboo leaf wrapped round the <i>baren</i> as cover
Kentō	registration marks carved on the block
Kentōnomi	flat chisel used for cutting/altering registration marks
Keta	wooden frame (deckle) used to form paper sheets
Ketsuochi	unwanted marks on a print from pigment on cleared areas
Keyaki	<i>Zelkova</i> – a strong-grained wood sometimes used for blocks
Kihada	creamy-yellow made from bark
Kikaibōsho	machine-made <i>hōsho</i> paper
Kimedashi	deep embossing
Kimekomi	zigzag method of printing with <i>baren</i>
Kiō	opaque yellow made from orpiment

Kirazuri	printing with mica powder to give silver effect
Kiridashi	cutting knife (also <i>hangitō</i>)
Kizuki	meaning pure fibre paper
Kizukihōsho	<i>hōsho</i> paper made from pure fibre
Komasuki	round gouge
Konjō	blue from ground azurite
Kōshime	fine cross-hatching used to print mosquito nets
Kōtakuzuri	glossy printing often used on black hair
Kotsuita	keyblock
Kōzo	paper mulberry <i>Broussonetia Kajiinoki Sieb</i> fibre used in papermaking
Kozōzuri	another name for <i>gomazuri</i> (sesame printing)
Kuchinashi	yellow from <i>Gardenia florida</i>
Kumadori bokashi	soft gradation often used on cheeks, faces
Kurokawa	the outside layer of the stripped bark for making paper
Kusairo	green
Kusashiō	gamboge yellow
Kyōgō	print from keyblock including <i>kentō</i>
Kyokushi	smooth paper made from <i>mitsumata</i>
Lauan	<i>Shorea negrosensis</i> plywood used to make blocks
Madake	species of bamboo leaf used to wrap <i>baren</i>
Marubake	round brush without handle used to mix pigment on block (also called <i>burashi</i>)
Marunomi	round chisel
Masagami	a type of <i>hōsho</i> paper
Mawashi	circular method of printing with <i>baren</i>
Meiji era	1868–1912
Minogami	<i>kōzo</i> paper, often used as <i>usumino</i> for original drawing
Mimitsuki	deckle edge to <i>washi</i>
Mitsumata	<i>Edgeworthia chrysantha</i> fibre used in papermaking
Mizubake	broad water brush used for wetting paper
Mokumezuri	printing showing wood grain
Momigami	<i>mica</i> printed paper crumpled, then re-sized giving crackled effect
Murasaki	purple
Nagaresabi	body of carved brushstroke
Nagashizuki	Japanese method of papermaking using long, matted fibres and repeated dippings
Naginata	bladed beater used in papermaking
Nagura	fine whetstone used for grinding other stones
Neri	mucilage used in papermaking
Nikawa	animal glue/binder used to make size
Niko	two strand bamboo rope – first stage of making <i>baren shin</i>
Nishiki-e	literally ‘brocade picture’. Polychrome print about 1764–5
Nishinouchi	<i>kōzo</i> paper often used for books
Nomi	chisel
Nori	rice paste
Ōbokashi	broad gradation
Ōban	common print size (39.4 x 26.5cm approx.)

Ōbōsho	full-sized <i>hōsho</i> sheet (39.4 x 53cm approx.)
Ōdo	yellow ochre
Otogirisu	<i>Hypericum erectum</i> /St John's Wort
Otosu	staggered way of stacking damp prints/paper
Rokushō	green made from copper carbonate
Sabitsuke	carving effect imitating brushstrokes (also <i>kasure</i>)
Sankakutō	V-shaped gouge
Sarae	clearing the blocks around cut area
Sekiō	yellow from orpiment
Sekishiō	yellow from orpiment
Sha	fine silk gauze used on deckle in papermaking
Shiageto	fine whetstone used to finish blades
Shina	basswood (<i>Tilia japonica</i>): plywood used for blocks
Shintorinoko	machine made <i>torinoko</i> -type paper
Shiō	gamboge
Shiratake	bamboo leaf used to make <i>shin</i> for the <i>baren</i>
Shirokawa	white inside of bark used to make paper
Shīto	pile of finished sheets of wet paper in papermaking
Shōmenzuri	literally 'front printing'. Polishing the front of a print on a block to bring out a shiny pattern.
Shu	vermilion
Shunga	Japanese erotic prints
Sōainomi	large flattish chisel
Sōsaku Hanga	Creative Print Movement (early 20th century)
Su	slatted bamboo gauze used on deckle in papermaking
Sumi	Japanese black ink made from soot
Sumiban	keyblock
Suō	red colour made from sappanwood
Suzuri	inkstone used for rubbing <i>sumi</i> stick
Taisha	red/ochre similar to Burnt Sienna
Taishō era	1912–1926
Takuzuri	reverse block frottage technique using ink applied with a soft pad (<i>tanpo</i>)
Tamari	unwanted blurred edge to printed area through excess pigment
Tamezuki	Western-style papermaking, fibrous solution lifted onto deckle and drained
Tan	red/orange from lead oxide
Tanpo	soft cloth pad used to apply ink in <i>takuzuri</i>
Toishi	whetstones
Tokibō	brush used to transfer colour to block (also called <i>hakobi</i>)
Tokusa	horsetail/scouring rush from <i>Equisetum</i> family used for <i>itabokashi</i>
Tomarisabi	end point of carved brushstroke
Tomegire	folded damp cloths used under block during printing
Tōō	gamboge
Torinoko	smooth-surfaced paper made from mixture of fibres
Tororoaoi	root used to make mucilage (<i>neri</i>) for papermaking
Tsubushi	flat colour printing (also called <i>betazuri</i>)

Tsuge	boxwood
Tsuyugusa	blue flower, <i>Commelina communis</i> used for colour
Tsuyazuri	reverse printing also called <i>shōmenzuri</i>
Ukiyo-e	literally 'pictures of the floating world'
Ukon	strong yellow made from turmeric
Unmo	mica powder sprinkled onto prints
Urazuri	printing from the reverse forcing the colour through to the front
Urushi-e	literally 'lacquer print' using rich black as highlights on black areas
Usumino	thin <i>minogami</i>
Washi	Japanese paper
Yakko	Eight strand <i>baren</i> cord
Yamoto-e	Japanese school of painting
Yamazakura	wild mountain cherry used for blocks
Yōkō	carmine from Europe
Yubisambon	three fingers width – measure around printing areas
Zōkin	folded cloth used to wipe block
Zubiki	thin <i>washi</i> tracing paper
Zumi	yellow made from bark

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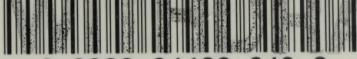
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Japanese Woodblock Printing

Of all the sophisticated traditional arts and crafts of Japan, woodblock prints are probably the most widely known in the West. The bold yet refined compositions are as fresh to the Western eye today as they were when they first came to the attention of the Impressionists in the 19th century. With their fluid lines, intricate carving and delicate colours, Japanese prints are still as fascinating as ever.

In this book, Rebecca Salter takes us through the history of the Japanese woodblock, discusses the materials, tools and papers available (and their Western equivalents) and shows how to get the most out of them through interesting step-by-step projects. The work of an international group of artists shows the varied and exciting work being produced today.

Rebecca Salter has been a woodblock printer for over 20 years. She has spent many years in Japan where she learnt the Japanese woodblock technique. She has exhibited internationally and her work appears in collections throughout the world including the Tate Gallery, the British Museum and the San Francisco Museum of Modern Art. Salter has written widely about printmaking and teaches at Camberwell College of Arts, the London Institute.

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